

ANNUAL SPECIAL ISSUE JUNE 29 1940

Vol. CXXXII

No. 3151



ELI LILLY & COMPANY LIMITED

BASINGSTOKE, HANTS.

FOR PHARMACEUTICAL AND BIOLOGICAL PRODUCTS

PHARMACEUTICAL CHEMICALS

Spot in Bond, C.I.F. on Contract

ALKALOIDS—REAGENT—CHEMICALS

BOTANICALS RECD. TIADE MARK

We can quote strictly com-

We can quote strictly competitive prices either for spot delivery or on contract and request the opportunity of proving we are competitive

Phone National 3831 for enquiries for_

HORMONE PRODUCTS
ENDOCRINE PRODUCTS
VITAMIN PRODUCTS
CRUDE DRUGS
AMERICAN ESSENTIAL OILS, etc.

We are remaining in London. Our stocks are in London. We are in touch with sources of supply in all Neutral and Allied Countries and therefore are in a position to offer at advantageous prices.

We know we can serve you - give us the opportunity!

BIDDLE, SAWYER & COLTD

Incorporating—THE OLD STRAND CHEMICAL & DRUG CO.

EMPIRE HOUSE, ST. MARTIN'S-LE-GRAND LONDON, E.C.1

Telephone: NATional 3831 (5 lines) Telegrams: BIDSAWYA, CENT, LONDON



and the research goes on

Through more than 30 years the pioneer work of the Glaxo Laboratories has been observed by the medical and pharmaceutical professions with growing respect. The development of the original milk-food led to an expansion of research far beyond the realms of infant dietetics, into those of vitamin synthesis, bacteriology, and organic chemistry. The first result was Ostelin vitamin D, soon followed by Adexolin, GlucoDin, and many other pharmaceutical preparations now prescribed as a matter of course in hospitals, clinics and private practice everywhere. To-day over sixty such G.L. preparations are available for the restoration and maintenance of health. All come under the C.F. scheme. All have been solidly proven in clinical trial—almost all are concerned with the adaptation of nutritional substances for maximum therapeutic effectiveness. And the research goes on . . .

SOME PRODUCTS OF THE GLAXO LABORATORIES

COLLOIDALCALCIUM with OSTELIN OSTOCALCIUM CALDEFERRUM OSTERMILK OSTOMALT MINADEX ADEXOLIN GLUCODIN FERSOLATE. ETHAMOLIN VITEOLIN ANTIVIRIN KAPILON DEROBIN PREPALIN MERSAGEL FLAVOGEL FERROLAC

EXAMEN COLACT FAREX

BERIN CELIN

DISSOLVED VACCINES G.L. SULPHANILAMIDE G.L. PHYSOLACTIN



LTD., GREENFORD, MIDDLESEX. BYRon 3434 ABORATORIES



A CASCADE OF SPUN EXPORT ZINC DINTMENT B.P.

IS A GUARANTEE THAT THE PREPARATION

CONTRACTOR TO H.M. GOVERNMENT

ROBERT BLACKIE

MANUFACTURING CHEMIST

SHEN WORKS, MELON ROAD, PECKHAM, LONDON, S.E.15

TELEGRAMS: "USHENSPUNA LONDON"

TELEPHONE: RODNEY 3874 (Private Exchange)



Drene—already the largest-selling shampoo in the world—is now available for export overseas. Ask your agent to get in touch with the manufacturers of Drene Shampoo, Dept. C.D. 296, Thomas Hedley & Company Ltd., Brettenham House, Wellington Street, Strand, London, W.C.2.

The amazing new Drene Shampoo is making big profits for retailers easily and quickly all over the globe.

Here are some reasons why Drene is the biggest-selling shampoo in two hemispheres:

- 1 Drene Shampoo leaves even dull hair sparkling and full of glistening highlights.
- **2** Bleached or tinted hair becomes more lustrous, more 'natural' after a Drene Shampoo.
- Because Drene cannot leave a sticky film on the hair such as old-fashioned shampoos do, Drene Shampoo reveals new glamour, new fascinating beauty in the hair.
- There are two kinds of Drene to choose from, Regular Drene and Special Drene. Special Drene is particularly good for hard-to-manage bair.

- **5** All types of hair become as easy to set as A.B.C. right after a Drene Shampoo.
- 6 Drene is quick and easy to use—no messy mixing beforehand and no special rinses are required.
- 7 Drene Shampoo removes all trace of embarrassing dandruff after only one shampoo.
- **8** Drene Shampoo makes five times more lather than ordinary shampoos, even in hard water.
- **9** Medical evidence states that Drene Shampoo is mild and absolutely safe.

Are YOU displaying the New

brush bristles? without

Beautiful new Counter container FREE with an order for 6 dozen.

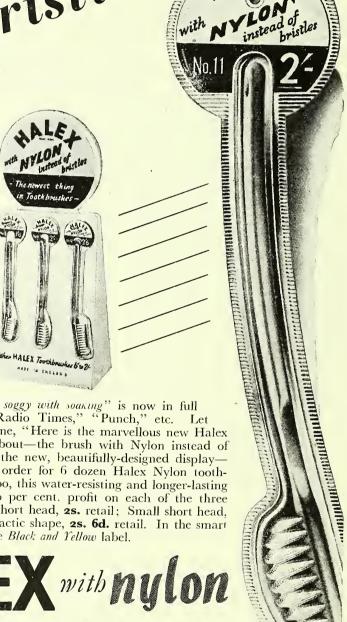
HALEX with nylon instead of bristles

finest bristle brushes too

For customers who prefer a fine quality pure bristle brush, there's a size, a shape and a colour in the Halex range to match taste. Sold in the Halex streamline case with Black and Red label and subject to the usual 33½% discount.

Advertising for the toothbrush that "doesn't go soggy with soaking" is now in full swing, appearing in National newspapers, "Radio Times," "Punch," etc. Let your counter tell everyone, "Here is the marvellous new Halex you've been reading about—the brush with Nylon instead of bristles!" Qualify for the new, beautifully-designed display it's yours free with an order for 6 dozen Halex Nylon toothbrushes. Remember, too, this water-resisting and longer-lasting Halex allows you a 40 per cent. profit on each of the three Halex Nylon shapes: Short head, 2s. retail; Small short head, 1s. 6d. retail; Prophylactic shape, 2s. 6d. retail. In the smart streamline case with the Black and Yellow label.

HALEX with nylon INSTEAD OF BRISTLES



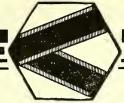
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SCHERING Ltd.

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FLOWERS • TABLETS CAMPHOR TECHNICAL

CHEMICALS -

ACID TANNIC • CELLOIDIN • CALCIUM GLYCEROPHOSPHATE LAELUCOSE ● CAUSTIC POTASH B.P. ● CAUSTIC SODA B.P. MUSTARD OIL (ARTIFICIAL) ● TERPINEOL ● THYMOL CRYST B.P. • UREA PURE B.P. • UREA TECHNICAL • URETHANE

TRADE MARK BRANDS -

"ALBUCID" • "ARCANOL" • "ATOPHAN" • BALSAM • "ATOPHAN" • "ATOPHANYL" ● "BETA-EUCAINE" ● "CHLORYLEN" ● "CORTIRON" ● "CYLOTROPIN" ● "FORTAMIN" ● "MEDINAL" ● "NEOTROPIN" ● "NEU-TRALON" ● "NOVATOPHAN" ● "PETEIN" ● PITRAPHOR!N" ● "PROGYNON" ⊕ "PROGYNON B OLEOSUM" ● "PROLUTON" ● "PROLUTON C" ● "PROVIRON" ● "SOLGANAL" ● "SOLGANAL B OLEOSUM" ● "SUBLAMIN" B" ● "UROTROPIN" ● "VALISAN" ● "VASANO" ● "VERAMON"

PLANT PROTECTION PRODUCTS

ABAVIT MERCURIAL DRY SEED DRESSING

RAPHANIT LIQUID CHARLOCK SPRAY

KARSAN

POTATO FUNGICIDE & BACTERICIDE

TRADE

POWDER NICOTINE INSECTICID

MARK

LEPIT FOR RATS AND RABBITS

SINAPHIT

POWDER NICOTINE INSECTICIDE

SCHERING LTD.

185-192 HIGH HOLBORN, LONDON, W.C.I

SPONGE HOUSE



HEAD-QUARTERS

LARGEST SPONGE WAREHOUSES IN THE WORLD

with the largest stocks of all Sponges imported direct by us from the Fisheries at lowest prices. Buyers are invited to call and inspect our large and varied stocks, and they will convince themselves that they are dealing in the "CHEAPEST MARKET."

MAKE YOUR PURCHASES OF SPONGES NOW FOR THE COMING SEASON

Having imported the best and cheapest parcels of Honeycomb and Fine Turkey sponges of the new season's Fishery, packed at our establishment at Ægina, Greece, we will offer special lines for chemists' trade at very low prices.

Being desirous of inducing Chemists to make window shows of excellent quality sponges at popular prices, we are offering these lines for the purpose of increasing the sale of Sponges amongst Chemists. It will pay to feature Sponges for the coming season, and we would strongly advise Chemists to select cases from the following list, which would enable them to make a display which would convince the public that the Sponges are being offered at attractive prices.

We are prepared to send any of the cases here offered, rail paid, which could be cellophane wrapped and ticketed if desired.

Chemists are invited to visit our warehouses, where the largest and cheapest stock is on view for their inspection in Honeycomb and Fine Turkey Sponges, in small original cases.

SPECIAL SALE LINES

						•													
BONEY	BOME	MED	IUM QUA	LITY TOIL	ET A	ND E	KTA	SPON	GES		CHI	AP Q	UALITY	TOILET AP					
			_	Average						Origina	i case			Average	price	per	piece	6d. 8d.	
.,	••	250		.,	10	.,	**	1/-	**	,,,	"	250		10	11	99 90	"	1/-	10
	,,	200	11	**	,,	11	**	1/4	**	,,,	11	160	**	11	**	99	**	1/6 1/9	99
	**	160		**	**	,,	,,	1/9	••	"	30 33	140	**	"	**	"	**	2/6	10
	**	140	**	**	**	"	,,	2/-	90	39		84	••	**	**	90	90	3/3	**
10	**	112	.,	••	,,	11	,,	3/-	10		, ,,	60	**	11	11	"	**_	4/6	"
**	**	96		**	10	11	11	3/6	"			-	_	be celloph					
=	**	84	**	**	**	11	,,	4/-	99					SPONGES (
24		72		**	**	**	11	4/6	**	Origina	u ease	96		Average	price	per	piece	2/9	acu.
10	**	60	11	**	*1	9.5	**	5/9	**	,,,	11	84	,,	"	"	11	**	3/3	**
94	17	45	9.7			,,	**	6/6	**	"	"	72 54	**	"	**	"	**	3/9 4/-	"
**		30						7/9		,,	19	45	11	,,	11	••		4/6	98

Branch of International Sponge Importers, Ltd.

Sponge Importers, Exporters and Merchants, and Chamois Leather Dressers

RED LION SQUARE, LONDON,

With the Largest Stocks of all Sponges Imported direct by us from the Fisheries at Lowest Prices

We Invite Competition

New Lising aign Advertising Campaign

for VINOLIA SHAVING PRODUCTS

Annonemental de la constantina della constantin The Group Gaptain cherishes it experience that a Vinolia shave The Squadron Leader is set on it ... Figure 12 something out The Flying Officer * In Bablice Desirer Cases

EVERY advertisement in our new National Advertising Campaign identifies the rank of a Naval or R.A.F. Officer. It pays homage to gallant men and, in topical vein, confirms their preference for Vinolia. We have good stocks of all Vinolia Shaving Products and. at the moment, we can let you have supplies of every item to meet the demand which the new Advertising Campaign will create. Order now and ensure your supplies -not subject to Limitation.

[1]
1/- Stick in metal case with
10d Refill in carton.

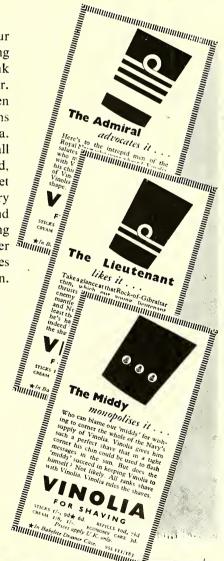
[2]
9d Stick in bakelite drainer case with 7½d Refill in carton.

6d Shaving Stick (Antiseptic) in metal case.

3d Shaving Cake in carton.

1/- & 1/6 Shaving Cream in cartonned tubes.

VINOLIA CO. LTD. BEBINGTON, CHES.





VINOLIA RULES THE SHAVES

DEARBORN PRODUCTS

PRICE LIST

(P.A.T.A.)

	Min.	Price
	P.A.T.A. Retail	to
MEDICALIETTE MANY C	Price	Dealer
MERCOLIZED WAX for the	0 (1	4 (6
complexion MERCOLIZED WAX for the	2/- jar	1/4
	3/6 jar or	4in 2.4
CLEMINITE for a face lotion	2/6 tin	
STALLAX for a shampoo	2/6 tin	
STALLAX (Small) for a shampoo	1/6 tin	
PHEMINOL for a hair remover	4/- jar	
JETTALINE for clearing the skin	3/6 tube	$2/7\frac{1}{2}$
BORANIUM for a hair tonic	2/6 tin -	1/101
PILENTA SOAP for the complexion	l/- tabl	
MENNALINE for the eyelashes	4/- tub	
COLLIANDUM (Solide) for a face tin	t 2/6	1/101
COLLIANDUM (Refill for Solide)	1 12	1/11
for a face tint COLLIANDUM (Powder) for a face tin	1/6	$1/1\frac{1}{2}$ $1/10\frac{1}{2}$
PROLACTUM for the lips	I /- tub	
PARSIDIUM an astringent face jelly	I/- tub	
TEKKO PASTE camphor cream	2/6 tub	
SILMERINE hair curling fluid		
TAMMALITE hair colour restorer	2/6 bottle	1/10/2
STYMOL for oily complexions and		
blackheads		
COCONOIDS for figure development		
SIPOLITE a hair remover COMPLEXION POWDER Natural,	2/ - ar	1/6
Rachel I, Rachel 2, Golden Tan	1 /0	1/2
POWDER CREAM Natural, Rachel		8d.
FOUNDATION CREAM	9d. tube	
FOUNDATION CREAM	1/3 tube	
LIP STICK Dark, Medium, Natural		2 4
LAVALLA sun tan cream	2/6 tube	$1/10\frac{1}{2}$

The Products of Messrs. PARKER, BELMONT & CO.

CLYNOL BERRIES (unstamped	1)		
for obesity	• • • •	4/→ jar	2/8
SOFT PALERIUM for wrinkles	•••	5/- jar	3/9

A Bonus of 10% is allowed on orders of £3 for cash with order and display, or through your wholesaler.

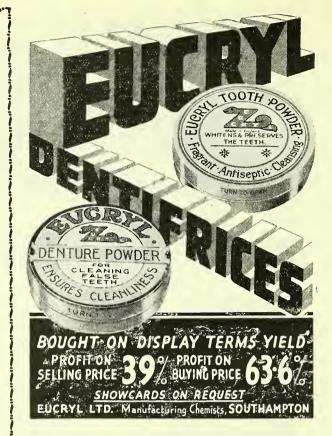
Order from Your Wholesaler, or from ?

DEARBORN (1923) LIMITED

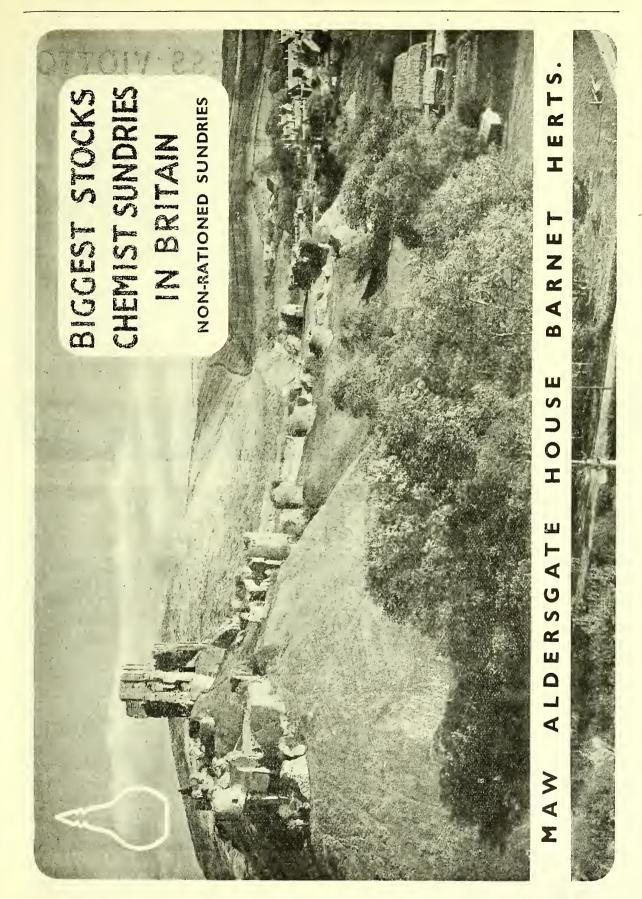
37 Gray's Inn Road, London, W.C.1

Cable and Telegraphic Address : JAVEDAN, HOLB, LONDON

Telephone No. : HOLborn 9669









" WHAT DO YOU RECOMMEND

FOR KEEPING HANDS

When women (as they do!) confide in their chemist and rely on his recommendation, advice given must guard goodwill and ensure customer satisfaction. For keeping hands soft and white, no safer or sounder advice is possible than: "Use ESS VIOTTO,

Made by Bronnley, a name traditionally famous for quality, ESS VIOTTO sales show increasing popularity each succeeding year—the result of consistent satisfaction and increased national advertising. Display and recommend ESS VIOTTO for profitable, frequent sales.

ESS VIOTTO



For the Hands & Complexion

by Bronnley

Popular Size 2/6 Economy Sizes 4/9 and 6/9

H. BRONNLEY & CO. LTD., ACTON VALE, LONDON, W.



Dr Page-Barker's

SCURF AND DANDRUFF LOTION The recognised specific for -SCURF and DANDRUFF

Made in TWO SIZES -

STANDARD ... 18/- dog. FAMILY SIZE .. 24/- doz.

RETAIL 276

P.A.T.A.

THREE BOTTLES FREE WITH EVERY 3 DOZEN

Smart showmatter with all orders

A MONEY - BACK GUARANTEE WITH EVERY BOTTLE

Sells on its reputation to those who know,

THOS. CHRISTY & CO. LTD.

4-12 OLD SWAN LANE. LONDON, E.C.



HARLENE HAIR TOILET

PREPARATIONS

SEND YOUR ORDER TO-DAY Second to None For Over 50 YEARS

HARLENE HAIR TOILET Preparations have enjoyed an uninterrupted demand for over 50 years. The public know them to be without equal. A large and extensive Advertising Campaign is constantly reminding them that for their every hair problem there is a Harlene answer. Check up your needs now from the range alongside. Make sure of obtaining a good stock because Harlene Shelves soon empty.

EDWARDS HARLENE LTD.

20/26 Lamb's Conduit Street London, W.C.I

HARLENE HAIR GROWER AND TONIC

CREMEX SHAMPOO

UZON BRILLIANTINE

HARLENE WAVE-SETTING LOTION

ASTOL HAIR COLOUR RESTORER

HARLENE CAMOMILE GOLDEN HAIR

WASH

HARLENE CAMOMILE SHAMPOO HARLENE GOLDEN WAVE-SET HARLENE HAIR CREAM

HARLENE Soapless SHAVING CREAM HARLENE SCALP OINTMENT



Greater demand for Larola... are you ready?

- Since the War, Larola, as in 1914, has not only maintained but strengthened its enviable position both at home and abroad as the most successful seller for the hands and complexion.
 - Sales, already above normal,
 are still soaring. Larola is the
 original of its
 absolutely pure . . free from
 pore-clogging ingredients, and
 women demand it.
 - Advertisements, read by millions of women each year, are being fully maintained in Society journals, women's magazines, the foreign and colonial press. Display matter and special terms for Window Display for home orders can be obtained on request.

EXPORT

Exporters and Shippers should note that NO export licence is required for "Larola" and "Glycerine and Cucumber."

Larola

Write for prices and terms of all Larola products to

M. BEETHAM & SON

CHELTENHAM

ENGLAND



WHEN THIS IS
THE SUBJECT OF
ENQUIRY, SEND
FOR OUR NEW
ILLUSTRATED
PRICE-LIST

ALL BRITISH BRUSHES FOR ALL MARKETS

The_

PROGRESS SHAVING BRUSH

Office and Works: MOTTRAM STREET STOCKPORT, ENG. 'Phone: STO. 2147 Cables: Siragoma, Stockport London Showrooms: E. S. BIRD 39 ALDERMANBURY LONDON, E.C.2 'Phone, MET. 6046



SOLE : THOMAS WARD & SONS LT!



CO-OPERATION!

It is because of the wholehearted co-operation of you people in the retail trade that GOYA perfume and GOYA face powder have, in a comparatively short space of time, a fine name, a sound reputation and—most important—the tremendous goodwill of thousands of women all over the country—we thank you. May we say, too, that in these critical days—with your help—we look forward confidently to the future. For our part we are going to keep the famous creations of GOYA before the public and to advertise them wherever it is possible to do so. We ask your further co-operation. We ask you to display GOYA's products on your counters and in your windows. Our representative will be calling on you within the next week or so but, if in the meantime, your stocks of GOYA perfume and powder are low or you are short of display material please let us know your requirements NOW.

GOYA PERFUME 42- 21- 6/6 HANDBAG SIZE - 1/3

GOYA FACE POWDER

—in lovely non-spill boxes

Trade price less 33½% discount.

Obtainable from all wholesalers or



direct from GOYA, PICCADILLY, LONDON, W.I



THE efficiency of Nurona in the prevention and cure of sunburn has brought into being a host of imitators and the vogue of "Safe Sunbathing" has profited every chemist. "Tan without Tears" was and still is our slogan—for sunbathing is health-giving and, war or no war, people are going to sunbathe this summer.

Last year, Nurona *Sunbronze* Cream was introduced and proved very successful. A white vanishing cream, also an excellent base for powder, its continued popularity is as certain as that of the Suntan Cream, which has enjoyed an increasing popularity for the past six years.

NURONA Sunbronze and Suntan CREAMS

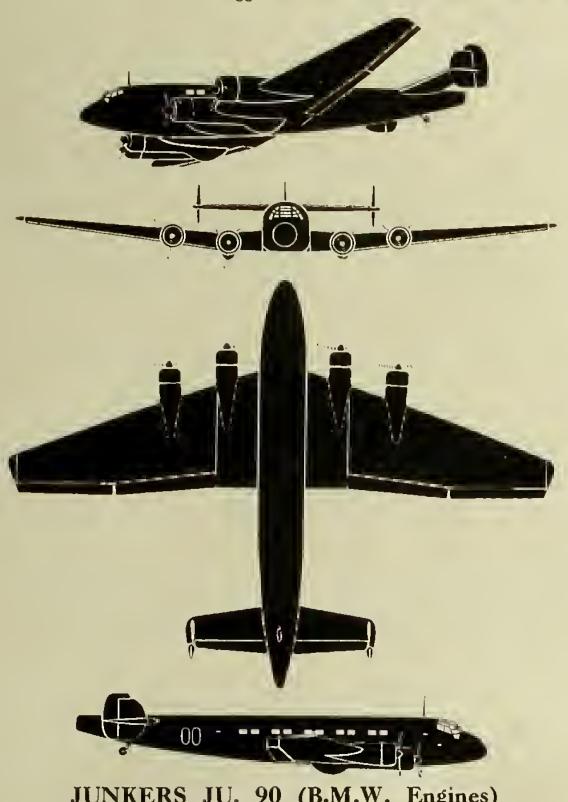
Suntan **1s.** per bottle Trade **7s. 6d.** per doz.

SUNBRONZE **1s. 3d.** per tube Trade **10s.** per doz. Packed in Display Outer of one dozen

Sole Manufacturers: JAMES WOOLLEY SONS & CO., LTD., Victoria Bridge. Manchester, 3

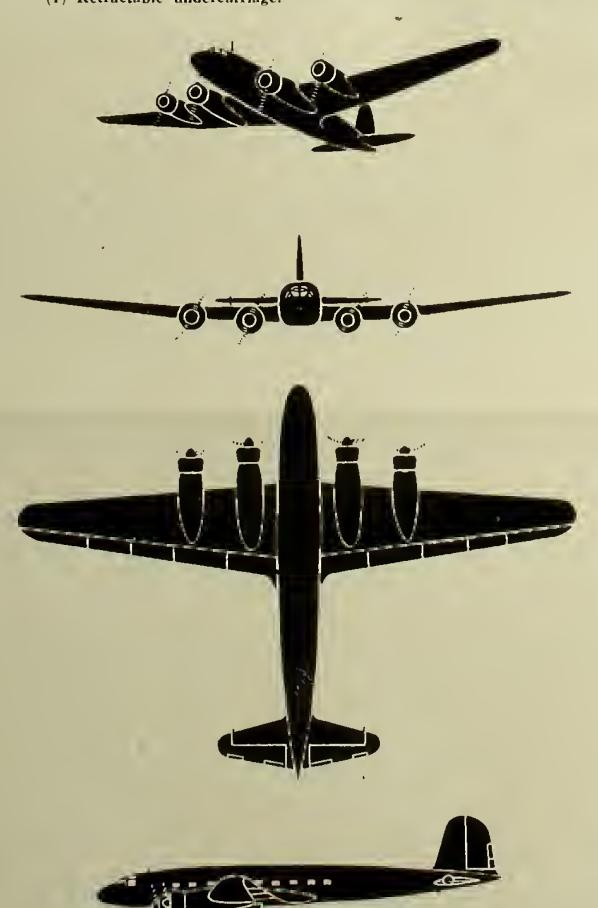
GERMAN TROOP-CARRYING AIRCRAFT

The War Office has asked us to publish these pictures of German Troop Carriers to help to distinguish the enemy. It is suggested that the sheet should be mounted on cardboard and hung in a prominent place.



JUNKERS JU. 90 (B.M.W. Engines)
DIMENSIONS:—Span. 115ft.; Length, 86ft.

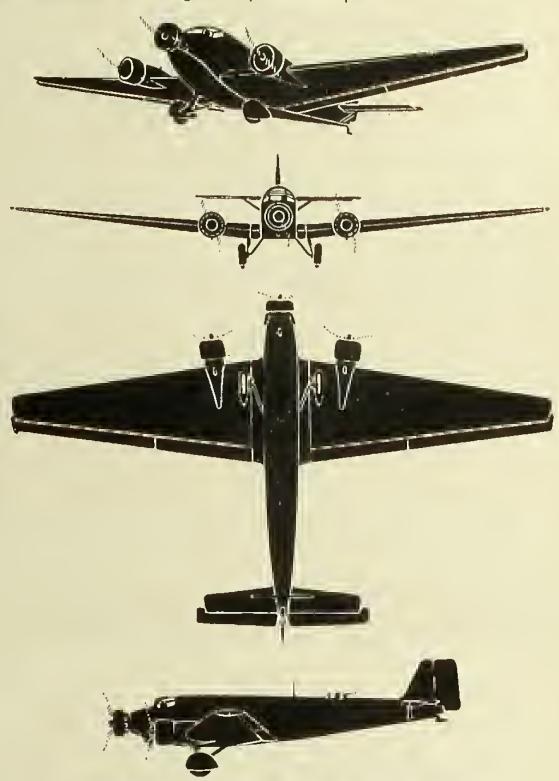
DISTINCTIVE FEATURES:—(1) Four engines; (2) Low wing; (3) Two rudders; (4) Tapered wings; (5) Leading edge of wing has very pronounced "sweep back"; (6) Square-cut wing-tips and tail plane; (7) Retractable undercarriage.



FOCKE-WULF 200 CONDOR (B.M.W. Engines)

DIMENSIONS:—Span, 108ft.; Length, 78ft.

DISTINCTIVE FEATURES:—(1) Four engines; (2) Low wing; (3) Single rudder; (4) Tapered wings; (5) Rounded wing-tips and tail plane; (6) Retractable undercarriage; (7) Smooth streamlined fusciage.

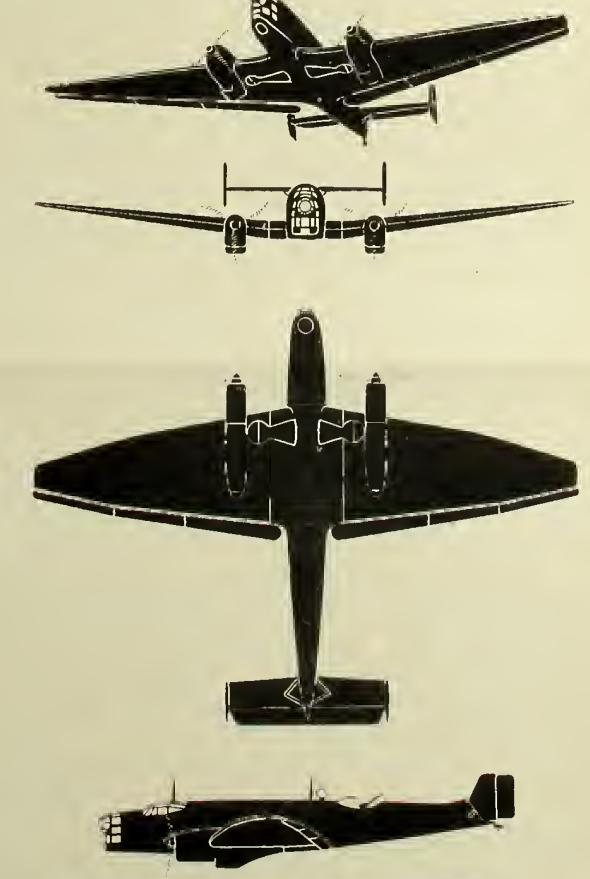


JUNKERS JU. 52 (B.M.W. Engines)

DIMENSIONS:—Span, 96ft.; Length, 62ft.

DISTINCTIVE FEATURES:—(1) Three engines; (2) Low wing;
(3) Single square-cut rudder; (4) Sharply tapered wings; (5) Square-cut wing-tips and tail plane; (6) Fixed undercarriage.

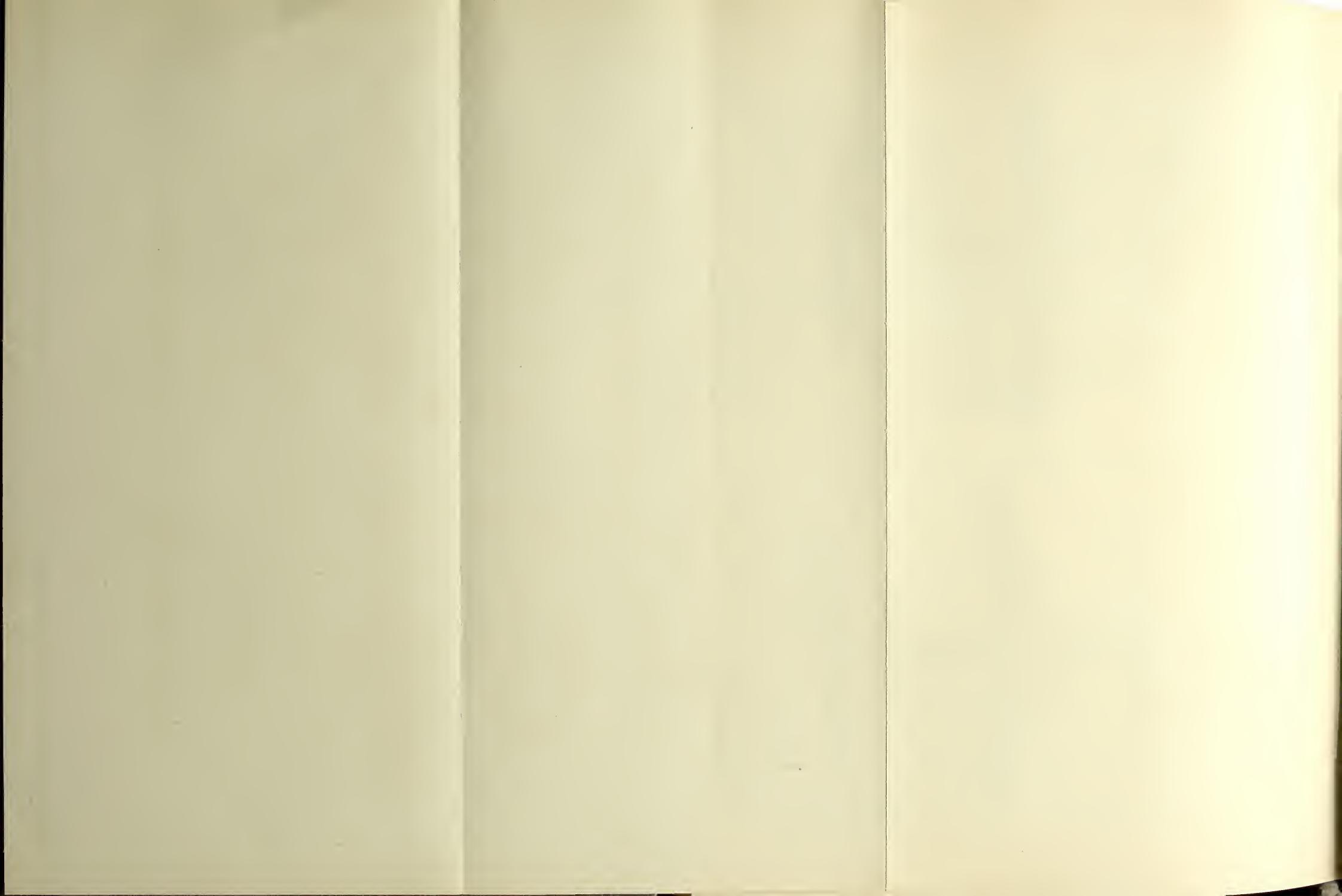
NOTE.—Most important German troop earrier, and the one normally used for parachute dropping.

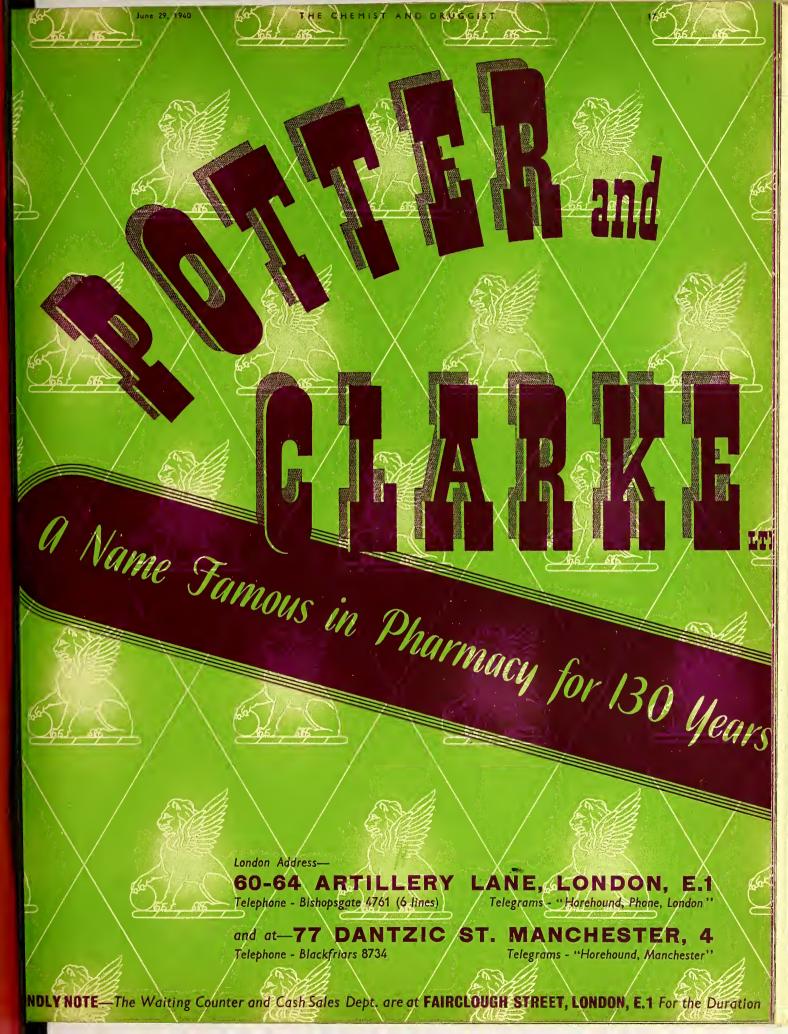


JUNKERS JU. 86 (JUMO Engines)

DIMENSIONS:-Span, 73ft. 8in.; Length, 57ft. 4in.

DISTINCTIVE FEATURES:—(1) Two engines; (2) Low wing; (3) Two square-cut rudders; (4) Sharply tapered wings; (5) Square-cut wingtips and tail plane; (6) Retractable undercarriage.





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for Dyspepsia

MADE ENTIRELY FROM ENGLISH DANDELION ROOT ROASTED AND GROUND . . .

> In Enamelled Tins P.A.T.A.

Is. **0**d. size **8/-** doz.

Is. 9d. ,, 15/- ,,

HANDSOME SHOWCARDS SUPPLIED WITH ALL ORDERS

3s. 0d. ,, 26/-





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KASBAH

KIDNEY CURE

A POSITIVE CURE FOR BACK-ACHE, GRAVEL AND ALL KIDNEY AND BLADDER DISEASES

9^{D.} Packets . . . 5/- Doz.

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POTTER'S CLEANSING HERBS

FOR INNER CLEANLINESS

For cleansing the stomach, liver, kidneys and intestines

7^{D.} Packets . . **4**/- Dozen

10^{D.} Packets . . 5/9 Dozen

The 10d. packets are sent out in delightful coloured show outers and make an attractive window display.

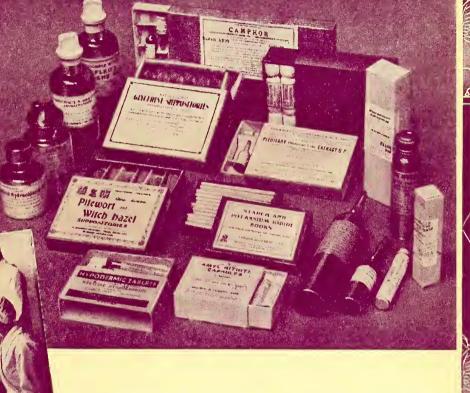
EACH CARTON OF A DOZEN CONTAINS 6 FREE SAMPLES



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UNREMITTING CARE & ATTENTION are behind all P&C preparations!

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POTTER'S ASTHMA CURE

CONSISTENTLY ADVERTISE IN ALL THE IMPORTANT NATIONAL NEWSPAPERS—THUS ENSURING A STEADY DEMAND

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Wholesale - - - - 14/- doz.
PACKED IN HALF-DOZENS

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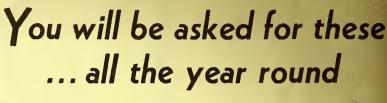
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Actual Growers of Belladonna, Chamomile, Foxglove, Henbane, Lavender

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OLEO RESINS, MEDICINAL RESINS
EXPRESSED JUICES, ESSENTIAL OILS

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"SANOID" ZINC AND STARCH TOILET POWDER. A firm favourite and always in demand. In packets and sprinkler top drums.

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> > SKIN OINTMENT. Incorporating Healing Vitamin "F"
> > Nationally Advertised—Sales restricted to legitimate channels.

"VARIBAN" ELASTIC
PLASTER BANDAGE MAY
BE DISPENSED UNDER THE

"THERMOID" ANODYNE
PLASTER. This plaster has
achieved considerable success in the
relief of congestion and other Chest
and Lung Disorders.

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MATHER'S

"WILMATH"
ELASTIC BANDAGES

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Relief:

Mather Zinc Oxide and Adhesive Plaister are quality products with a universal reputation . . .



This is one of our most successful lines. The colourful display card is a real silent salesman. The pack is definitely attractive. You can order from your usual wholesaler. We will gladly send full details on request.

There is a much larger trade to be done in Porous Plaisters than is usually realised. The secret is attractive display. Our new registered Display Box is undoubtedly the last word in Plaister containers. It sells them with the greatest of ease. Put a box on your counter and watch how quickly they sell.







The 2d., 3d. and 6d. sizes may be obtained in our Potent Spring Shell Containers. See illustration.

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TELEGRAMS/

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The Malt that can





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MADE FROM THE BEST BRITISH BARLEY UNDER IDEAL CONDITIONS



The superior quality these malt products worthy of your careful consideration.

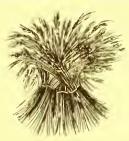
This 'trouble - free' malt extract gives satisfaction both to buyer and seller. Dignified and attractive packing, super-quality product, and keenly interesting prices are points worth noting-and investigating.

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PEA AND FEATHERY CRYSTALS

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SLOUGH 21864

Wrist Straps (Leather)

THE CHEMIST AND DRUGGIST

6d. profit on every sa





SANIDENT in its extra large bottle offers generous value to both the chemist and his customers. The quality is better than ever, and there has so far been no change in price, so the chemist still makes a profit of 6d. on every sale.

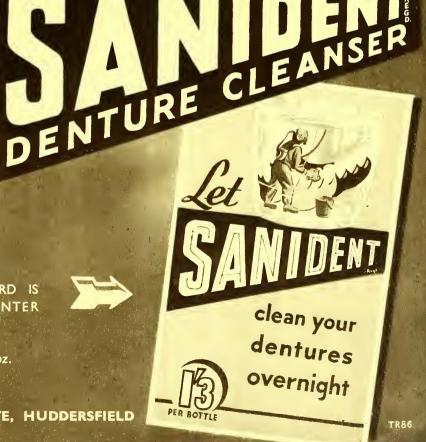
> THIS NOVEL AND EFFECTIVE SHOWCARD IS AVAILABLE FOR WINDOW OR COUNTER



Retail 1/3 per bottle.

Trade price 91- per doz.

THORNTON & ROSS LTD., LINTHWAITE, HUDDERSFIELD



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WAR-TIME INCREASES DEMAND FOR VETERINARY PRODUCTS

Evans Programme of Advertising to Farmers will create new business all over the country

A vigorous advertising campaign for the Evans range of veterinary products is now in full swing in the National papers devoted to farming, dairy, pig-breeding and poultry rearing interests. Healthy stock is a matter of national importance in these times and the veterinary demand will be correspondingly stimulated throughout agricultural areas. A

long tradition of responsible service to the public is associated with the extensive research laboratories and modern equipment of the Evans Biological Institute. Evans sponsor a range of products which can be relied upon to consolidate your goodwill with the farming community and to increase your turnover while providing a good, consistent margin of profit on every sale.



Write for lists, terms and free literature for the information of your customers.

Turkey breeders will be asking you for

MALAGRIDE AND MARSAN

—the effective treatment for Blackhead. Blackhead can destroy up to 90% of a brood of young turkeys unless effectively countered at the outset of the disease. The production of effective anti-Blackhead preparations has been a particularly difficult problem successfully solved by the Evans Biological Institute.

MALAGRIDE is particularly recommended for young birds where injection is found difficult. It is prepared in tablets available in bottles of 25 at 4/-, or 100 at 14/6; dosage varying with the age of the bird from ½ tablet to 2 tablets daily for four days.

MARSAN now in prepared solution, is recommended whenever injection is considered practicable. 3/- ampoules contain sufficient to inject 10—5lb. birds (injection can usually be carried out by the turkey keeper but in case of doubt the help of a veterinary surgeon or of the county poultry instructor should be enlisted).

The profit margin is 33\frac{1}{3}\% on sale. For both products, there is an additional bonus of thirteen to the dozen for orders of one dozen or more. In the case of Malagride the two sizes may be assorted for this purpose.

PROFIT BY THE NATIONAL ADVERTISING CAMPAIGN FOR EVANS VETERINARY PRODUCTS

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Ext. Hepatis Liq. B.P. Ext. Hepatis Sicc. B.P.,

PITUITARY

Whole Gland.

Anterior Lobe.

Posterior Lobe.

Corpus Luteum: Ovarian Substance and Residue.

Suprarenal; Thyroid B.P.; Orchitic Mammary; Thymus.

Prostate.

Peptone;

Hog Stomach. Parathyroid.

Adrenalin Natural Ovarian Hormone Cryst. Stilbæstrol di-propionate



- •• **HYPEROL**? Solid Hydrogen Peroxide (in powder and tablets)
- 66 KALMOPYRIN 39 Calcium Acetylsalicylate
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• GEDEON RICHTER PRODUCTS ARE MADE IN ENGLAND

FOUR YEARS OF RESEARCH

BRAND TABLETS

ALKA-

What it is and what it does

Here is full information concerning 'Alka-Seltzer' and the laboratory work on which the claims made for it in advertising are based.

'Alka-Seltzer' is intended and recommended for use in those simple conditions for which the public does not generally consult a physician.

'Alka-Seltzer' is composed of medicinal ingredients which the physician has used and found satisfactory over a great number of years. It is a tablet which contains five grains of acetyl salicylic acid, with sodium bicarbonate and citric acid; these are so combined in 'Alka-Seltzer,' that when dissolved in water they make a bubbling solution of sodium acetyl salicylate, sodium bicarbonate and sodium citrate.

To prove that the claims made for 'Alka-Seltzer' in our national advertising are true, four years have been spent in clinical experiments and study. The research problems covered are as follows:—

THAT the analgesic in 'Alka-Seltzer' is presented in the form of sodium acetyl salicylate.

THAT 'Alka-Seltzer' exerts a local antacid effect in the stomach.

THAT it provides a systemic alkalizing action after absorption.

THAT it tends to hasten gastric emptying time in cases of persistent gastric hyperacidity.

THAT it helps to relieve hyperacidity following alcohol consumption.

THAT it is more rapidly evacuated from the stomach than plain acetyl salicylic acid.

THAT it dialyzes more rapidly than acetyl salicylic acid suspensions.

THAT doses of ten to twenty grains of acetyl salicylic acid as such or as 'Alka-Seltzer,' exert no effect on the heart.

THAT 'Alka-Seltzer' increases the capacity of human subjects to do strenuous physical work.

THAT 'Alka-Seltzer' speeds recovery from fatigue.

You can recommend 'Alka-Seltzer' with confidence. Those who use it find it does what they hope it will. They come back for more.

SOLE DISTRIBUTORS: DON S. MOMAND LTD., 10-15, CHITTY STREET, LONDON, W.I

Alka-Seltzer

Alka-Seltzer' with confidence. Those who use it find it does what they hope it will. They come back for more.



SMARTEST PACKS—BIGGEST PROFITS



THE DAISY "20"

An elegant little counter display for split bulk sales. Contains 20 Powders each in sealed envelopes. This little carton deserves a show on every chemist's counter. Costs but 2/-from any Wholesaler but sells for 3/4d. A precedent in profit for a National Proprietary line.

THE NEW I/- SIZE "DAISY"



Gives better value. DAISY Powders are now being advertised at 2d. each, 7 Powders for I/-. Encourage your DAISY customers to buy in I/-packets. Your wholesaler has this line.

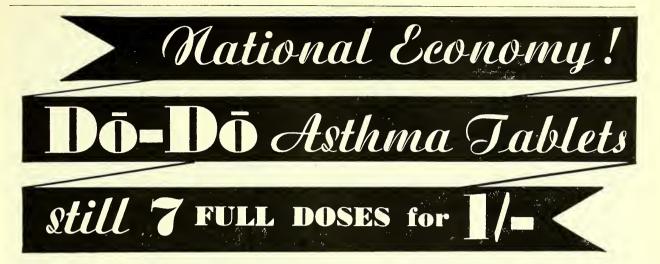
NOTE: DAISY POWDERS are now sold in two sizes only—the DAISY "20" and the I/- size. Have both Packs in stock!

DAISY TABLETS

Counter Display Carton contains I dozen 6d. Tubes. Tubes in cellulosed Aluminium each in Art Carton. Smartest little 6d. outfit extant. Your Wholesaler can supply at 4/- per dozen tubes. DAISY TABLETS are available in sizes to retail at 3d., 6d., 1/3d., 3/- and 5/- each.



J. E. ELLIS, LTD. . . HORSFORTH . . LEEDS



A remedy which enables the individual to keep "hard at it" is of national importance, and money spent on it is wisely spent.

Tens of thousands of sufferers from Asthma are doing work of vital importance to our war effort. Tell them what you know to be true—that in Dō-Dō Asthma Tablets they get the largest amount of potent, quick-acting medicaments at the smallest possible cost.

Dō-Dō (Brand) Asthma Tablets are being persistently and consistently nationally advertised at the pre-war (retail) prices of 7 tablets for 1s.; 30 tablets for 3s.; 120 tablets for 10s. 6d.

A small quantity of Attractive Display Matter is still available. Write to the Sole Manufacturers:



INTERNATIONAL LABORATORIES LTD

I-3 Smedley Street LONDON, S.W.8

Telephone: MACauley 5101

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TRY OUR EXTRA RECTIFIED

FOR YOUR PERFUMERY

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FOR YOUR TINCTURES

ABSOLUTE ALCOHOL

Duty Paid and Duty Free for Export and Scientific Purposes

"BEEFEATER" GIN___THE PUREST AND BEST.

Burrough's Invalid Port.

Ports for Medicating Purposes.

"White Cross" Whisky, Brandy and Rum.

Spanish Sherry.

British Sherry.

Lime Juice Cordial.

"Bourg Frères" Champagne, in Botts., ½-Botts., and ½-Botts.

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"Bell Bird" Australian Wines.

Lemon, Orange and Grape Squashes.

"DONZARDO" Delicate Pale Dry SHERRY. Elegant Old Tawny "QUINTA REAL" PORT British Ruby, Tawny and White Port Style Wines

Write for Samples and Quotations stating if you hold a Wine Licence

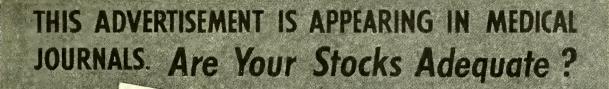
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Estab. at Chelsea 1820

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Telephone: Reliance 1166





BEE VENOM SOLUTION

SHARP & DONME LTD., LONDON

A new approach to the treatment of Arthritis and Neuritis

'LYOVAC' BEE VENOM SOLUTION

Since the early days of history, bee venom has frequently been referred to in medical literature for its value in the treatment of arthritis and neuritis. The factors which kept it from wide-spread use have now been overcome in 'Lyovac' Bee Venom Solution, which supplies standardized bee venom in a stable form which retains its potency for many years.

Published reports^{1, 2} of the effectiveness of Mulford 'Lyovac' Bee Venom Solution in reducing swelling, relieving pain and improving joint motility are paralleled by similar reports from physicians in general practice. It is indicated in the treatment

of acute and chronic arthritis. It appears to be most effective in extra-articular mani-

SHARP & DOHME LTD Mulford Biological Laboratories

76-78 CITY ROAD, LONDON, E.C.1. South Med. & Surg., 100:5555, Nov., '38

Flame-sealed stem Depression for breaking off stem Rubber stopper 10 dehydrated bee silngs under vacuum

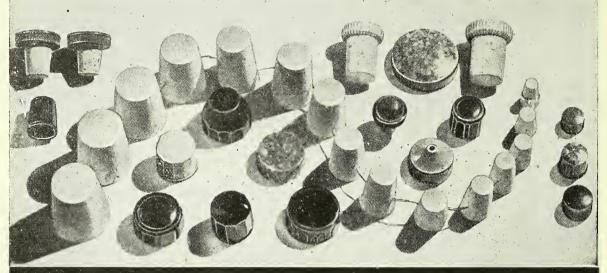
Mulford 'Lyovac' Bee Venom Solution Is packaged under the new lyophile process by which is packaged under the naw tyophile process by which the original therapeutic value of trashly prepared the original therapeutic value of trainly prepared biological substances at the time of their highest potency is retained for many years.

festations, such as muscular rheumatism, sciatica, lumbago, neuritis, and iritis.

Mulford 'Lyovac' Bee Venom Solution represents the whole venom of ten bee stings. After candle filtration, for sterility, the solution is rapidly frozen and rapidly dehydrated under high vacuum. It is preserved under vacuum in the specially devised (Vacule) flame-sealed ampoule-vial.

Detailed information on the use of this product, the dosage schedule and method of application will

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Wholesale only

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Mundet Cork Products Ltd.

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THE MODERN CHEMIST

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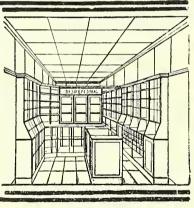
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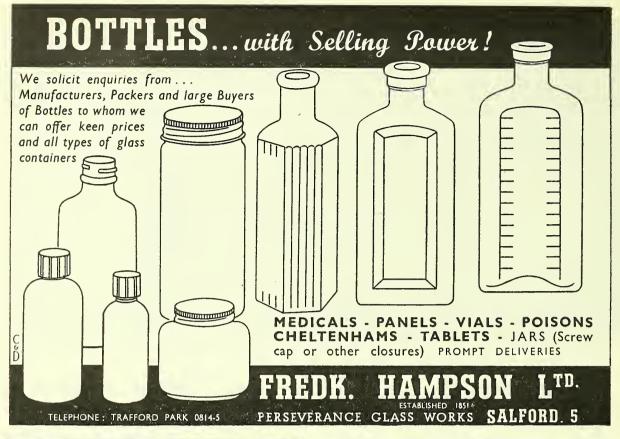
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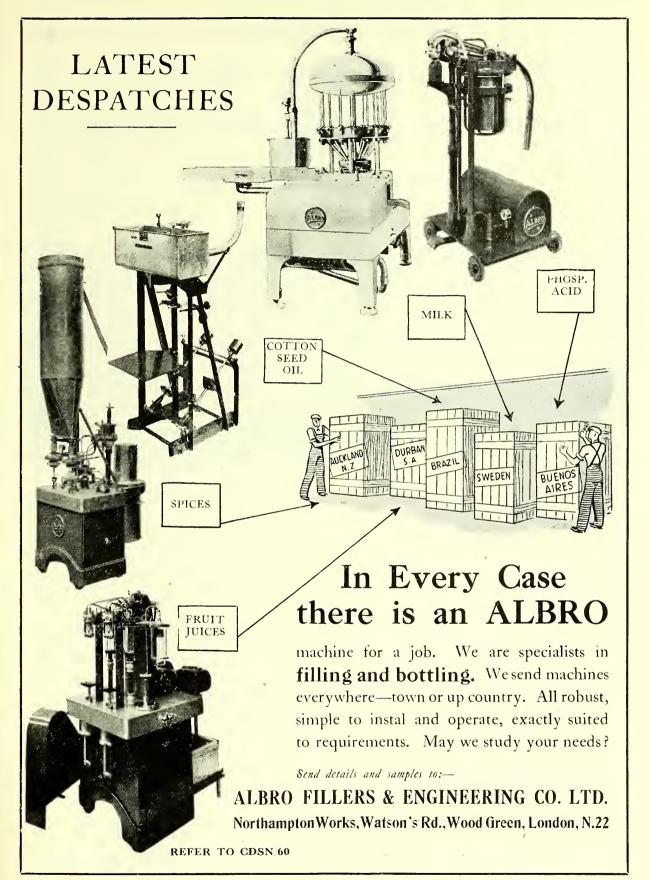
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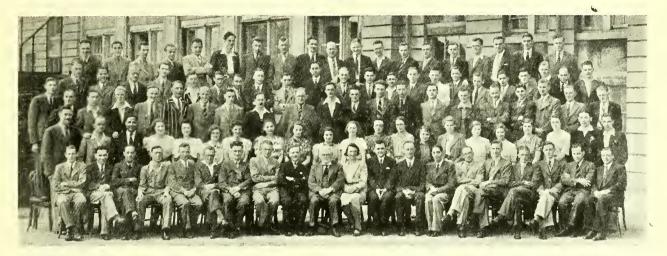
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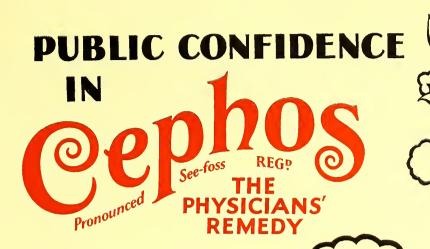
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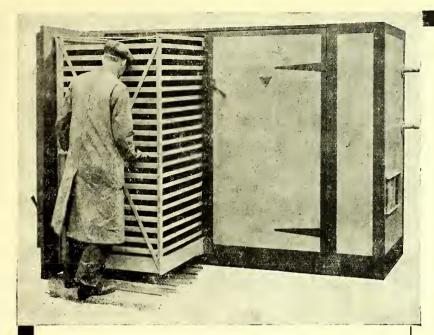
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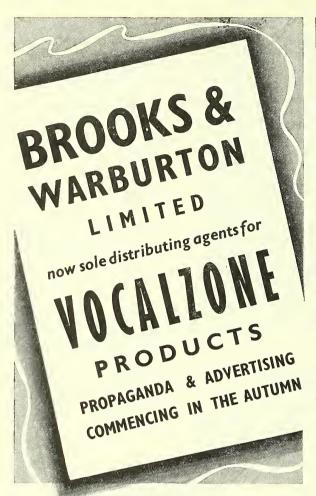
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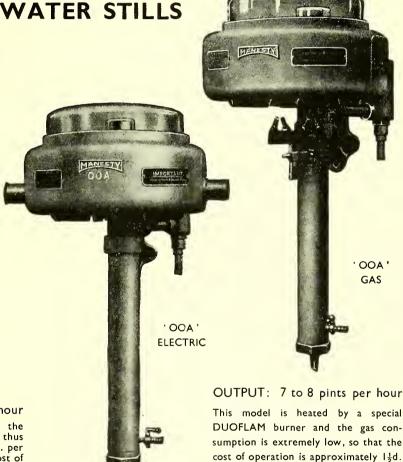
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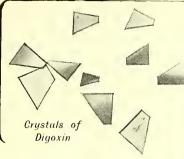
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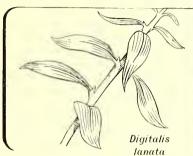
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NEWS OF THE WEEK

Rationing of Glucose.—The Ministry of Food announces that the allocation of glucose to manufacturers of medicinal preparations and drugs will remain at 100 per cent. of pre-war usage after July 1, 1940. The allocation of sugar for these products will be reduced by 10 per cent. from that date as previously announced (C. & D., May 25, p. 379).

Exports to France.—The Board of Trade have made an export Control Order (No. 19 of 1940), taking effect from June 24, under which the export of all classes of goods to French territories in Europe, including Corsica, is prohibited. A revocation of outstanding licences for exports to the territories in question has been issued at the same time.

Limitation of Supplies.—Under the Limitation of Supplies (Miscellaneous) Order (C. & D., June 15, p. 427) manufacturers and wholesalers of various classes of goods were required to register by June 20. The time limit has now been extended to June 30. The Board of Trade has set up a special department at Fanum House, Leicester Square, London, W.I. to deal with the registration.

Control of Imports. — Government contractors and sub-contractors are urged by the Board of Trade to avoid all unnecessary imports and at the same time to assist in speeding up delivery of imports essential for completion of urgent war contracts. Delay in delivery of essential imports is being caused by failure of contractors to comply promptly and fully with import licensing requirements. This can be remedied by: (1) Applying for import licences well in advance and not when goods have arrived at ports; (2) forwarding with applications evidence that the goods are essential for a specified Government contract and cannot be bought in this country

Closure Industry Export Group.—An export group embracing the manufacturers of every type of closure (patented or otherwise), for use with containers, has been formed and officially recognised by the Export Council of the Board of Trade. Membership is open to every manufacturer of closures or to manufacturers of capsules, seals or other similar devices (other than lead capsules). The chairman of the group is Mr. E. A. Blanch (Kork-N-Seal, Ltd.) and the secretary Mr. A. Hodson (Metal Closures, Ltd.). Particulars can be obtained from the secretary, Closure Industry Export Group, 53 Park Farm Road, Bickley, Kent. Telephone: Chislehurst 2241.

Import Licences for Petroleum Products.—Notice to Importers No. 77, issued by the Import Licensing Department of the Board of Trade, states that import licences for petroleum, both crude and refined, and for all petroleum products, including paraffin wax, petroleum bitumen and medicinal paraffin, will be issued on the advice of the Petroleum Department. Applications for licences should be addressed to the Petroleum Department, Westminster House, Dean Stanley Street, Millbank, London, S.W.I. Forms of applica-tion may be obtained from the Import Licensing Department, 23 Southampton Buildings, Chancery Lane, London, W.C.2, from the Petroleum Department, or from the office of any Collector of Customs and Excise.

Condensed Milk and Milk Powder Order.—The Minister of Food is prepared to issue licences under the Condensed Milk and Milk Powder (Control) Order, 1940 (C. & D. Coloured Supplement, June 15), for the purpose of enabling persons who use condensed milk or milk powder in the manufacture or preparation of any product to sell free of the restrictions imposed by the Order any stocks of such products that were manufactured and ready for sale prior to June 17, 1940. The operation of any licence will be limited to the period ending on July 15, 1940. Any person desiring to obtain a licence for the above purpose must (1) make application in writing before

June 30 to the Milk Products Branch, Ministry of Food, Horseferry Road, London, S.W.1.; and (2) supply particulars certified by a firm of accountants specifying the quantity and nature of the products which were manufactured by him before June 17 and were ready for sale on that date.

Treatment of Air-raid Casualties.—The following statement was made by the Pharmaceutical Society after consultation with the Ministry of Health. (r) It is essential that every casualty that can be dealt with through the first-aid organisation provided by local authorities (including mobile first-aid units) should receive treatment by that means; (2) therefore, persons not sufficiently seriously injured to be taken by ambulance to hospital should be treated at first-aid posts and not at a pharmacy; (3) chemists should record in writing in their pharmacies the situation of the nearest first-aid posts; (4) if a chemist decides that injuries to persons in the neighbourhood of his pharmacy are serious and require immediate treatment, and the local authority's first-aid organisation is, because of the heavy numbers of casualties or for some other reason, unable to deal with them, he will render first aid, using such dressings as may be necessary; (5) if he is unable to obtain payment either at the time or subsequently from the person treated, he may make application to the local authority for payment; (6) this application should include the name and address of the patient and a statement of the material used and of the reasons why it was decided to treat the injuries at the pharmacy instead of relying on the official organisation; (7) where these reasons are satisfactory, the chemist may anticipate repayment from public money. Where he meets difficulties he should submit a statement of the facts to the Pharmaceutical Society,

Pest Control Chemicals Export Group.—At a recent meeting of interested firms, the Pest Control Chemicals Export Group was formally inaugurated. The Group has now received the recognition of the Export Council of the Board of Trade. Any British persons, firms or bodies corporate actively engaged in the manufacture and export of pest-control chemical products, e.g. (a) disinfectants, (b) sheep and cattle dips, (c) agricultural insecticides and fungicides and (d) animal medicines and allied products, are eligible for membership of the Group. The main Group comprises four autonomous sub-groups to deal with the problems arising from each of the sections of industry outlined above. The Group will co-operate with the Export Council and the various Government Departments, and will welcome co-operation with other allied export groups. Thirty-six firms have already signified their intention of joining the Group. Any other firms interested can obtain full particulars on application to the Group at 166 Piccadilly, London, W.I. The chairman of the Group and of the General Executive Committee is Mr. H. M. Spackman (Jeyes Sanitary Compounds Co., Ltd.), and Mr. T. Ainslie Robertson (Plant Protection, Ltd.) is the vice-chairman. The general executive committee will consist of the chairman and vice-chairman of the Group, representing respectively the disinfectant sub-group and the agricultural insecticides and fungicides sub-group, together with the following:—Mr. F. H. Hall (agricultural insecticides and fungicides sub-group), Mr. V. G. Hine (animal medicines and allied products sub-group), Mr. D. S. A. McDougall (disinfectant subgroup), Mr. L. K. Osmond (animal medicine and allied products sub-group), Mr. H. A. Smith (sheep and cattle dip sub-group), Mr. W. E. O. Walker-Leigh (sheep and cattle dip sub-group). A nominated representative of the Association of British Chemical Manufacturers will be an *ex-officio* member of the general executive The first problems of the Group will be in connexion committee. with materials in short supply, and already the Group is actively engaged in the allocation of timber for packaging purposes for the

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export trade. The investigation of the best methods of securing increased British trade in world markets will follow.

London Medical Exhibition.—In view of the present situation the exhibitors have been canvassed by the organisers and have decided by a majority vote that the exhibition arranged for next month shall be postponed.

Fewer Listed Sellers in Salford.—Salford city analyst, in his annual report issued recently, states that 153 shopkeepers have been registered as sellers of Part II poisons, against 159 in 1939, 168 in 1937 and 173 in 1936.

Manchester Chemists' Golf.—In the annual competition for the Neal prize played at Crompton and Royton Golf Club on June 12, the leading returns were:—S. M. Bostock, 71 (Neal prize); J. A. Collins, 72 (second prize); J. Dearden, 72; C. L. Compston, 74.

Pharmacy Act Prosecutions.—At Keighley, on June 18, Keighley Industrial Co-operative Society. Ltd., were fined £5 for the unlawful sale of a preparation containing poison and £2 for selling the product without labelling it with the name and address of the seller.—At Middlesbrough, on June 17, Annie Kirkup was fined £2 for similar offences

West Ham Association of Pharmacists.—At a meeting of the Association and National Pharmaceutical Union Branch on June 18, Mr. M. Blumenthal in the chair, Mr. J. Hearle (chairman, N.P.U.) spoke on "The Prices of Goods Act" and "The Purchase Tax." Questions followed. A collection in aid of the Pharmaceutical Society's Benevolent Fund realised 27s.

Protecting Food against Poison Gas.—The Ministry of Food has issued a publication (price 3d.) entitled "Food and its Protection against Poison Gas." The contents are divided into six parts dealing respectively with general considerations; growing crops, livestock, etc.; bulk stores in warehouses and docks; shops, hotels, institutions; domestic protection; food and livestock in markets.

South-West London Chemists' Association.—The following officers have been elected: President, Miss E. B. Blundell; Vicepresidents, Mr. F. J. S. Begg and Mrs. V. S. I. Browne; Treasurer, Mr. P. H. Woodnoth; Chairman, National Pharmaceutical Union Branch, Mr. H. R. Edgecombe; General Secretary, Mrs. V. S. I. Browne, 158 Wandle Road, Morden, Surrey; Social Secretary, Mr. E. Neville Browne; Trade and Proprietary Articles Trade Association Local Secretary, Mr. W. L. Darby. All members of the branch of the Society who had been attending special classes were successful in recens examinations in first aid. The branch committee has given a guarantee that £21 7s. will be raised by the branch for the Anglo-Trench Ambulance Corps fund.

Sales Conference at Birmingham.—In place of the usual annual week-end staff conference of Boxfoldia, Ltd., Birmingham, a one-day Conference was held recently. About 150 employees from the staff and works attended, together with interested visitors and apprentices and staff on active service but stationed in or near Birmingham. Mr. C. H. Foyle (managing director) welcomed the visitors. A talk on "Safety First" was given by Miss D. Farquhar (an inspector of factories). Discussion followed on various aspects that had been raised, and a vote of thanks followed. After lunch, Dr. Donald Stewart spoke on "Industrial Health in War." Dr. Stewart pointed out that all the laws about health in industry had been initiated by intelligent employers. Today the Factory Acts and their requirements were a minimum standard, and the majority of employers went much further than the minimum.

In reply to a question about juvenile workers, Dr. Stewart agreed that we must look to the future; the health of young people must not be so injured that there could not be built up after the war a healthy, sound, skilled-working nation.

Mr. H. Woodbine (Birmingham City Libraries) also spoke. The final session of the Conference was taken by Dr. Raymond Priestley (vice-chancellor, University of Birmingham), who gave an account of experiences with the explorers Shackleton and Scott.

North London Annual Meeting.—The annual meeting of the North London Pharmaceutical Association and Branch was held recently. The secretary's report on the work of the past session showed that the majority of shops in North London had signified their agreement to code new prescriptions, and a British Red Cross detachment of pharmacists was in process of formation. The committee and officers were reappointed (Mr. L. Hayward, Chairman; Mr. A. E. Footitt, 28 Hill Rise, Potters Bar, Secretary), with the addition of Mr. W. J. Woodley as successor to Mr. D. Anderson as local officer in Hornsey, and Dr. Coutts, who would represent the Association in the City and Holborn. The following were elected branch representatives to the Conference:—Miss Hodgkinson, Messrs. Hayward, Hearle, Coutts and Footitt. The meeting was then addressed by Mr. R. H. Kemp (organisation officer, National

Pharmaceutical Union) on "War-time Profits." In the discussion which followed, Mr. Broad thought that the purchase tax should distinguish between crude drugs and proprietaries. The chairman suggested that the Union might include changes in the prices of proprietaries in their monthly list, as had been done in part of the branch area, and as was provided for by company shops. Mr. Kemp explained the difficulty of compiling such a list to make it representative over the whole country, and that prices were often out of date as soon as published. Mr. Booth complained that wholesale prices of certain Chemists' Friends articles had increased without a corresponding change in retail prices. Mr. Kemp explained that any change in basic profit of a C.F. article must first be submitted to the C.F. Committee. Mr. Hearle supported this by saying that service, discount, and profits must be kept distinct. Mr. J. C. Young regretted that few suggestions had been made to maintain profits in the evacuated areas.

IRELAND

Strychnine Death.—At an adjourned inquest on Archibald McCleary, Dunaird, Broughshane, co. Antrim, whose death was attributed to strychnine poisoning, the jury considered there was not sufficient evidence to show whether it was self-administered, and returned an open verdict.

Golf.—The Irish Chemists' Golfing Society and the Ulster Chemists' Golfing Association have agreed not to hold this year the competition for The British Drug Houses cup, in view of war conditions. The next outing of the Irish Chemists' Golfing Society will be to Mullingar on Sunday, July 14, when an eighteen-hole stroke competition will be held in the morning and an eighteen-hole bogey in the afternoon. Trophies for both competitions have been presented by Proprietaries (Eire), Ltd., Dublin. The Society wishes all members travelling from Dublin to make the journey by the special bus that is being requisitioned; given sufficient support individual fares will be extremely moderate. Those intending to travel in this way should notify Mr. A. F. Roche (secretary of the Society) 34 Donnybrook Road, Dublin.

SCOTLAND

Aberdeen Closing Hours.—The Burgh Insurance Committee on June 17 notified the Department of Health that they saw no reason to alter their view that insured persons suffer no hardship through chemists' closing at 7 p.m.

Alteration in Sugar Arrangements.—A communication from the Sugar Area Officer for Scotland and Northern Ireland intimates that, from July 1, allocations to sugar-using manufacturers will be subject to a reduction of 10 per cent. The reduction will apply to sugar for pharmaceutical purposes. From that date retail chemists will be put, like other sugar-using manufacturers, on a monthly basis, and any chemist who had signed the Scotlish Pharmaceutical Federation's pink form should at once complete a new official form that has been sent to them, substituting "lb." for "cwt." If a chemist is unable to produce evidence of past usage, local Food Officers may use their discretion in issuing permits at the appropriate percentage of an assumed basic usage of not more than 112 lb. per year. The form (S.M.A.) should be returned to the local Food Officer. Any chemist who has more than one shop should obtain additional forms from his local Food Office in respect of each other shop.

EMPIRE AND FOREIGN NEWS

Pharmacy Week Stamp Urged in U.S.A.—Pharmacists throughout the United States invited customers during April to sign a petition to the Postmaster-General that a special stamp should be issued in honour of pharmacy, on the occasion of the 120th anniversary of the United States Pharmacopæia this year.

U.S.P. Revision Enforcement Postponed.—On the recommendation of the committee of revision of the United States Pharmacopœia XII, enforcement of the standards for surgical gut, which were announced in the Second Supplement to the U.S.P. XI (see *C. & D.*, March 16, p. 207), are postponed until January 1, 1941.

Canadian Pharmacy Profits.—According to a census of trading results of independent retail drug stores in Canada taken recently by the Dominion Bureau of Statistics, the average gross margin of profit in pharmacy operation in Canada was 29.8 per cent. of sales, and the average trading expenses were 27.6 per cent. The report, which was based on returns from 370 independent retail drug stores, revealed that only 63 per cent. of the pharmacies in the survey had shown a profit on the year's trading, after making allowance for an imputed value for the proprietor's services.

LEGAL REPORTS

Injunction Granted.—The motion by the County Perfumery Co., Ltd. (C. & D., June 8, p. 414), on which Mr. Justice Bennett in the Chancery Division on May 31 granted an interim injunction ex parte restraining an alleged infringement by Mr. M. Whitty, hairdresser, Downham Way, Grove Park, Bromley, of plaintiffs' registered trade marks for Brylcreem, was again before his lordship on June 11. Mr. Lloyd-Jacob, for plaintiffs, stated that the exparte injunction was granted over ten days and he was now asking that it should be continued until the trial of the action.

His lordship said that the defendant would be restrained from infringing the trade marks in question until trial or further order.

Appeal Dismissed.—The Court of Appeal on June 19 heard an appeal by Mr. Alfred Moore Hogarth, manufacturing chemist, Golder's Green Road, London, N.W., from the dismissal, by Mr. Justice Greaves-Lord, in the King's Bench Division, of his claim against Pharmaceutical Products, Ltd., and Savory & Moore, Ltd., Welbeck Street, London, W., as distributors and agents, for damages for alleged breach of agreement in regard to the distribution and sale of Mr. Hogarth's dental preparation NDK.

By an agreement of March 1938, the distributors had "full discretion as to the method, amount and cost of advertising and shall carry out such advertising and publicity programme as they may, in their absolute discretion, think fit." Mr. Hogarth complained that the defendants had not advertised his product sufficiently and had failed to implement their undertaking to introduce it to the public.

The defendants denied all the plaintiff's allegations and contended that they had fulfilled the agreement.

Giving judgment dismissing the appeal Lord Justice Mackinnon said that it was perfectly clear that, having regard to the wording of the agreement, no possible claim by the plaintiff for failure to advertise his product could possibly succeed.

The only remaining matter was the alleged breach of the provision that the defendants would introduce the plaintiff's dental preparation to the public. It was alleged that they had not been sufficiently active and energetic in doing that.

The defendants did in fact sell the preparation in their own forty shops and put it on sale in other shops. It was impossible to suggest that, on a proper construction of the agreement, which vested entire discretion in the defendants in the way they were to do their business, the plaintiff could establish any breach of contract.

The defendants had done all they promised to do in taking a minimum quantity of the preparation from the plaintiff, and beyond that Mr. Hogarth had no claim. Lord Justice Clauson agreed.

COMPANY NEWS

P.C. means Private Company and R.O. Registered Office

S. S. Holford, Ltd. (P.C.).—Capital £1,000. Objects: To carry on business as wholesale or retail chemists and druggists, etc. R.O.: 86 Allerton Road, Liverpool.

TIDBURY'S (CHEMISTS), LTD. (P.C.).—Capital £1,000. Objects: To carry on business as manufacturers of and dealers in chemicals, drugs, etc. Eric Witter, M.P.S., is a director. R.O.: 93 St. Mary Street, Southampton.

ARTHUR T. GRAY, LTD. (P.C.).—Capital £1,000. Objects: To carry on business as pharmaceutical and general chemists, herbalists, drug merchants, etc. Stanley Ellis, M.P.S., is a director. R.O.: 5 High Street, Barnes, London, S.W.13.

STEPHEN SMITH & Co., LTD.—Owing to the death of Mr. Edwin F. King (chairman and managing director, Stephen Smith & Co., Ltd.) (see p. 479), the following appointments have been made:—Chairman, Brevet Lieut.-Col. F. F. MacCabe, M.B.; joint managing directors, Miss Florence Rouse and Mr. Redit Ganiford. Mr. B. W. Thornton (Wilson & Ellis, 8 Telegraph Street, London, E.C.) has joined the board. Mr. Leslie N. Salter remains as the director in Australia, and Mr. F. C. Aslin continues as director and secretary.

Kempthorne, Prosser & Co.'s New Zealand Drug Co., Ltd.—The sixty-first report (for the year ended January 31) shows a balance brought forward from the previous year of £39,952, to which is added the net profit for the year (£78,418). From this is deducted interim dividend for half-year to July 31, 1939, at 3½ per cent. (£20,405), leaving £97,965. The following appropriations are made: Dividend of 4½ per cent. (8 per cent. for year), £26,235; general reserve, £15,000; stock reserve, £16,850; carried forward, £39,880. Messrs. F. W. Mitchell and W. Taylor (retiring directors) were re-elected.

Private Arrangement.—S. Press (Chemists), Ltd., 118 North Street, Romford, Essex; 683 Finchley Road, London, N.W.; and The Vale Parade, Kingston Vale. A meeting of creditors was held recently, Mr. H. Sainer (liquidator in members' voluntary windingup) presiding. A statement of affairs was submitted, showing liabilities of £2,537. After allowing £309 for preferential claims, there were net assets of £822—a deficiency of £1,715. The principal assets were: Stock, £996; fixtures, £100. Mr. Sainer was appointed liquidator on April 5, a declaration of solvency having been filed. At that time it was anticipated that the businesses could be disposed of as going concerns, and a sum sufficient to discharge the liabilities in full obtained. Offers had since been received for certain assets. The creditors appointed a committee to consider the matter.

TOPICAL REFLECTIONS

Air Raids and Pharmacies.—It goes without saying that in air raids every pharmacist in business will render what help he can if injured people come to him. The pity is, as you point out in an editorial article (p. 449), that no willingness on the part of Government departments to recognise the potential value of this reserve of strength has so far been evident. The knowledge of first aid among pharmacists is admittedly a variable quantity; but while they have no intention of posing as amateur surgeons they can do all that is requisite, in the first instance, in the simpler cases that may arise in their shops. A few days ago the equipment of a first-aid post organised in a private house was described to me. The space for the treatment of casualties there consists of a single room: it is easy to foresee that overcrowding may result, and that the less seriously injured will have to be excluded. Another matter to which you draw attention is the examination of foods thought to be contaminated by gases. The cumbrous procedure outlined in the official memorandum referred to, namely, consultation between a subordinate official and the local public analyst or some other person or persons "approved by the authority" and the taking of samples, would be virtually useless in the case of fresh foods; whereas a few questions across a chemist's counter would usually settle the problem to everyone's satisfaction.

A Record of Poisonings.—Vour tabulation of statistics of poisoning in England and Wales (p. 446) is, as usual, of great importance to everyone concerned in the handling of these substances. Just over a century ago, as you showed in your issue of October 29, 1927 (p. 544), the systematic keeping of records of poisoning began in this country. Though these records are not as complete as chemists and others interested would like them to be, they constitute a general survey from which much may be learned. The small totals of accidental poisonings for the past five years, giving an annual average

of eighty-nine deaths, indicate a habit of vigilance on the part of those qualified to sell and dispense scheduled poisons to the public. Suicidal deaths by poison are, for obvious reasons, little influenced by the precautions taken in pharmacies: though large compared with the number in the accident columns they are still only about one-sixth of the number of deaths caused by road accidents. Lysol retains its unenviable priority among the substances favoured by suicides; and although opium and its preparations are subject to restrictions as narcotic drugs, thirteen people obtained supplies enabling them to take their own lives. The figures for strychnine show, as may have been expected, a decrease.

Debatable Cosmetics.—The "Journal of the American Medical Association" has returned to the subject of hormones and vitamins as ingredients in cosmetics (p. 450). I am not sure that the word "percutaneous," used by the authors of the monograph abstracted, has any advantage over "perdermal"—unless a word of five syllables is held to be more expressive than one of three syllables. As long ago as 1935 you inserted an article (September 21, p. 534) on hormone skin creams, and you have since kept your readers in touch with experimental work that has been done on the action or such products. Obviously, clinical observers are a long way from finality in their views of the effects of the inunction of creams and other forms of topical application containing hormones or vitamins. For the moment, the broad view is taken in the article referred to that such applications—I class them for the sake of brevity as of a single type—are "unpractical and uneconomical," and that certain degenerative changes may be induced by the promiscuous use of them. There is enough substance in this deduction to constitute a warning to chemists in business. One can readily visualise the consequences that might follow if a customer suspected any such product of causing physiological disturbance. Xrayser

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PHARMACEUTICAL SOCIETY OF NORTHERN IRELAND

The monthly meeting of the Northern Ireland Pharmaceutical Council was held at 73 University Street, Belfast, on June 21, the president (Mr. Walter C. Tate) in the chair. Also present were Mr. J. Glendinning (vice-president), Sir Thomas McMullan, Professor E. B. C. Mayrs, M.D., Messrs. H. F. Moore, S. Gibson, J.P., J. E. Connor, J.P., W. Martin, James McDowell, S. H. Forrest, C. Abernethy, J. W. Gray, J.P., J. Trevor Nicholl. The secretary (Mr. D. L. Kirkpatrick) was in attendance.

Mr. Glendinning, on behalf of the Council, congratulated the president on his recovery from indisposition.

The President, having returned thanks, said he was sorry to be the bearer of bad news. Since entering the building that afternoon he had been informed by Mr. Glendinning of the death of Mr. John Maxwell, Derry, a past-president of the Society. No words of his were necessary to say how much they had loved and esteemed Mr. Maxwell. He had occupied that chair very acceptably in the years 1933–34, and he (Mr. Tate) could recall vividly the visit of the Council to Derry to invest him with the chain of office—a gesture which had greatly pleased and touched their old friend. To the widow their deepest sympathy went out in her hour of sorrow. On the motion of the president the Council stood for a moment as a token of sympathy with Mrs. Maxwell.

Mr. Glendinning returned thanks on behalf of the widow.

A letter was read from the secretary of the Pharmaceutical Society of Great Britain thanking the Council for their promise of support in any case that might be put forward in favour of granting commissions in the Army to pharmacists. The British Council, the letter stated, intended to take the matter up again as soon as the time was propitious, and deeply appreciated the backing of the Northern Ireland body.

Mrs. Orr, Lisburn, wrote thanking the Society for their sympathy on the death of her husband. She forwarded as a gift to the library a certificate of the Apothecaries' Hall, dated September 13, 1839, which had been issued to Mr. Andrew McEwan, an ancestor of her family.

The Council recorded their appreciation of Mrs. Orr's gift, and accepted it with thanks.

Mr. J. A. Corkey, F.R.C.S.I. (secretary of the Belfast Division of the British Medical Association), wrote: "At a recent meeting of the Belfast Division concern was expressed at the ease with which sulphanilamide, sulphapyridine and related drugs find their way into the hands of the general public without a doctor's prescription. I was requested to write and ask you to put the matter before your Society with a view to having restrictions put on the sale of these substances. That such a restriction is necessary seems to be incontestable, and in Great Britain I understand such sales are under very strict control. I raised the matter with Dr. McCloy and on his suggestion discussed it with Mr. Pinkerton, the Ministry's inspector, who, I understand, agrees that regulation is desirable."

The Council decided to get in touch with the Ministry of Home Affairs to see if they could obtain a new schedule and to offer their co-operation in its preparation.

The secretary reported that the following had passed the pharmaceutical Preliminary summer examination—Margaret A. E. McCartney, R. McCullagh, R. E. P. McDonagh, J. G. McGivern and E. B. Williamson. On the motion of Mr. Forrest, seconded by Mr. Abernethy, Mr. James Alexander Strahan, 10 Knockbreda Park. Belfast, was elected a member of the Society.

MR. Moore raised the question of the possibility of air raids on Northern Ireland and said that every chemist shop should be like a first-aid post and fully stocked, in particular with morphine tablets. It would be of great assistance to doctors if chemists were thus prepared for the treatment of casualties.

Mr. ABERNETHY thought it was up to the Home Office to give chemists a lead in that matter.

NEW BOOKS

Appleyard, F. N., and Lyons, C. G.—Practical Pharmaceutical Chemistry. $7\frac{1}{2}$ in. by 5 in. Pp. 174. 6s. 6d. Sir Isaac Pitman & Sons, Ltd., Parker Street, London, W.C.2.

[In the fourth edition of this work, which, it will be recalled, is intended to provide students with a systematic course in the more important subdivisions of pharmaceutical chemistry, the authors have made a useful addition by extending the chapter on qualitative organic analysis. Schemes for the examination of organic substances and the detection of elements in organic compounds have been included. In the other chapters some minor changes have been carried out.]

Gunn, J. A.—An Introduction to Pharmacology and Therapeutics. Sixth Edition. $6\frac{3}{4}$ in. by $4\frac{1}{4}$ in. Pp. 242. 6s. Humphrey Milford, Oxford University Press, Amen House, London, E.C.4.

[A further edition of this well-known work has recently made its appearance, in which has been incorporated an elementary summary of such knowledge as has accumulated in the fields of pharmacology and therapeutics since the publication of the last edition. The rapidity with which advances in this science have been made is borne out by the fact that the author has found it desirable to revise the book every two or three years. The general make-up of the volume is essentially the same as in the last edition, the number and titles of the chapters being unchanged and the length of the book only exceeding its predecessor by two pages.]

Child, E.—The Tools of the Chemist. $8\frac{3}{4}$ in. by 6 in. Pp. 220.

21s. New York: The Reinhold Publishing Corporation (London: Chapman & Hall, Ltd., Whyprights Street, London, W.C.)

Chapman & Hall, Ltd., 11 Henrietta Street, London, W.C.2).

[This book, which is the result of extensive research and lifelong experience, covers a subject hitherto little explored—the development of laboratory apparatus from very early times to the present day. Naturally, for it is an American publication, a considerable portion of the work deals with the history of the manufacture of scientific apparatus in the U.S.A., but, as the author has very properly gone back to European origins in the historical development of his subject, the book is full of interest for British readers. The subject-matter is divided into three parts, the first dealing with people and events in American chemistry, the second part with the development of American chemical laboratory apparatus and the third part with distributors of laboratory apparatus. The illustrations, as a collection, are probably unique, and will be of great assistance to students and historical research workers. The book is comprehensively indexed.]

Snell, F. D., and Snell, C. T.—Chemicals of Commerce. $8\frac{3}{4}$ in. by $5\frac{3}{4}$ in. Pp. 542. 28s. Chapman & Hall, Ltd., 11 Henrietta Street, London, W.C.2.

[This is a book of practical information on a wide variety of chemical substances, and should prove a useful addition to the chemist's library. It is not a chemical dictionary, but rather a collection of summarised information on different classes of chemical products used in commerce. The substances are described in short monographs which usually give the name, the formula, the general description, the method of manufacture, occasionally information about common impurities, commercial grades and uses. This order, which enables quick inspection of data to be made, is not necessarily strictly followed. In addition to the wide range of chemicals with which the book deals, chapters are included on such substances as fats and fatty oils, waxes, natural plant products, essential oils, resins, etc. The terminology has been made as little technical as possible, so that those connected with the chemical industry who may not have had advanced technical training will find no difficulty in using the book. The official standards usually referred to are those of the United States Pharmacopæia and National Formulary.]

Hilditch, T. P.—Chemical Constitution of Natural Fats.—10 in. by $6\frac{1}{2}$ in. Pp. 438. 35s. Chapman & Hall, Ltd., 11 Henrietta Street, London, W.C.2.

[As a basis of study of the natural fats the author of this work has adopted an original method of approach in treating these substances as a group of organic chemical compounds in a way similar to that employed in dealing with other natural groups such as carbohydrates, terpenes and alkaloids. The work begins with an introductory survey of the acids of mixed glycerides present in fats from different sources, and attention is drawn to correlations discernible between fat constitution and biological classification. With few exceptions, only fats whose component acids have been defined in some detail by modern methods are considered. Subsequent chapters are devoted to a more detailed consideration of the component acids and glycerides of various natural fats, and many aspects of fat synthesis and assimilation, biochemical problems and points connected with the industrial application of fats are also discussed. The final chapters deal with the constitution of individual acids and related compounds in fats, and give an account of the modern technique adopted in research on fatty substances. The author has obviously been at pains to include a very comprehensive list of bibliographical references to all chapters.]

PACKAGING PLASTICS IN

GOOD deal of attention is now being given to the claims of plastics for packaging and display purposes, as it is realised that future supplies of metal, glass, tin foil and even cartons may be uncertain, while it is probable that increases in the costs of these materials will make stringent economies necessary to

manufacturers of articles for sale or distribution.

Several types of plastics are available, and generous use is, indeed, already being made of them in specific applications. For non-rigid packages and "overwraps" there are transparent cellulose and rubber film materials, whilst for rigid containers to replace glass and metal there are moulded and built-up boxes and tubes of cellulose acetate; injection and compression mouldings of polystyrene and methyl methacrylate resins; and jars, closures, applicators and novelties of the urea and phenol-formaldehyde resins. Thus it will be realised that the scope of modern plastic materials is extensive, though not all are suitable for applications involving prolonged contact with or immersion in liquids and creams containing water and certain solvents. The reason for this is that many plastics absorb small proportions of moisture, and therefore swell, while they are

attacked by alcohol, esters and other organic liquids. All, however, are safe for packing the great majority of dry products.

Non-rigid Packs and Overwraps.—It may be pointed out that transparent cellulose wrapping material is available in plain transparent and moistureproof transparent forms. former is generally used for "overwraps" and the latter for making up into containers for powders, pills, tablets, etc. A proprietary transparent material has been successfully used as a combined container and package for pharmaceutical products, such as suppositories and tablets, presented individually; this is capable of being used separately without detriment to the unused products. Illustrations of such

packages accompany this article (p. 460). Although manufacturing chemists have not yet made any extensive use of transparent plastics for packing dry pharmaceutical products, the materials are worth considering should glass phials and jars become more difficult to secure at economic prices. Both the plain and the moisture-proof varieties can be easily sealed by heat or with transparent adhesive tape, and they can be printed in one or more colours. It is noteworthy that cellulose foil is resistant to poisonous gases in vapour form, while the moisture-proof foil affords protection against liquid gases such as mustard, and may easily be decontaminated. Transparent and coloured cellulose tapes are extensively used for sealing packs, and are also widely used in chemists' shops for sealing small packages at the counter. Many pharmacists use cellulose tape instead of sealing wax or string for small parcels and find it a more speedy and

effective method (Illustration, p. 460).

The rubber film material referred to above has been but recently introduced. The material, which is prepared from a hydrochloride of rubber, has attracted attention on account of its strength, flexibility and high resistance to moisture. Because of its complete stability under all conditions it is being used for packing liquids and pastes. It may be heat-sealed, printed, and generally handled as required in mass-production methods. The advantages claimed for cellulose- or rubber-based transparent foils as wrapping materials are cheapness, speed of production, full visibility coupled with adequate protection of contents, light weight and consequent low freight and bulk packaging costs, and the ease with which it may be printed upon in one or more colours. Transparent films are suitable for use in many applications in which previously tin or aluminium foils were preferred. They are, in fact, more economical, and can be made equally attractive and hygienic. The rubber-hydrochloride material is available in a range of metallic and solid colours, some of which are excellent for packaging purposes.

Cellulose Acetate Mouldings.—Cellulose acetate for manufacturing purposes is available in powder or granular form for injection and compression mouldings, as sheets for making up into boxes and tubes, and as rods for general fabricating. The powder, in transparent or opaque colours, can be used in modern injection presses capable of turning out complete mouldings weighing from 16 ounce

or less to six or seven ounces. Small tubes for packing pills, tablets wafers, suppositories, pessaries, etc., can be produced, as well as closures of various sizes and styles. The material is also suitable for moulding accessories such as scoops for filling compacts with powder, eye baths, and novelties. The transparent variety closely resembles glass, but is not fragile and will not splinter. The coloured varieties are permanent, do not "bleed," and are unaffected by light or by contact with, perhaps, the majority of pharmaceutical preparations. Cellulose acetate is soluble in low-molecular-weight esters, ketones and hydroxy esters; it softens in alcohol and esters; swells in chlorinated hydrocarbons; is insoluble in aromatic hydrocarbons, aliphatic hydrocarbons, animal oils, mineral oils, vegetable oils and ethers. It could be used to advantage in packing oily and greasy products, such as ointments, but is not considered satisfactory for holding aqueous compounds. Its water absorption figure is 1.4 to 2.0 in twenty-four hours. Sheets of cellulose acetate in clear and coloured grades, as well as in grained and novelty finishes, vary in size from about 50 \times 16 in. to 55 \times 24 in., and in thicknesses from 3/1000 in. to 1½ in. In general the most useful thickness for

Injection moulding press for use in the manufacture of articles from cellulose acetate or polystyrene resins

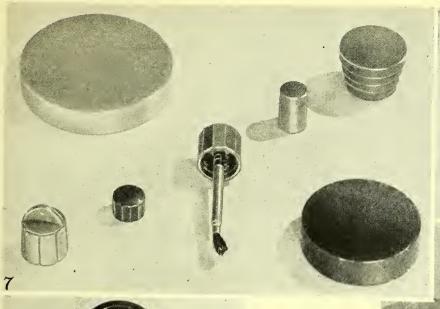
box-making is 10/1000 in. to 25/1000 in. Boxes may be either made entirely of the sheet material or provided with coloured cardboard bases. The sheets for box-making can be decorated in several ways, such as by goldblocking, painting, printing and metal-inlay work. Not only boxes but also tubes can be made up of the sheet material by means of "butt-welding," which consists of folding and welding with a solvent under pressure, or "spiral winding," which is generally preferred where colour effects are desired that cannot be produced by the extrusion method. The light-weight tubes produced can be manufactured in quantity at cheap rates and may be sealed with corks. They are thus suitable, other consider-

ations being met, for packing popular presentations of solid drugs such as capsules and tablets. Transparent acetate material in the form of extruded tubing is useful for making rigid-tube containers for certain types of drugs.

Polystyrene Resins.—The comparatively expensive mouldings made from the polystyrene resins, such as are produced by the injection and compression moulding processes, are suitable for packing many pharmaceutical preparations, both liquid and solid. The transparent variety of polystyrene is particularly recommended for this purpose, as its light-transmission is more than 90 per cent. and its high degree of clarity adds attractiveness to the product. Unlike cellulose acetate, which is fairly easily softened by alcohol, polystyrene is completely unaffected by even prolonged immersion in absolute alcohol. The water-absorption figure of polystyrene is also low by comparison with that of cellulose acetate (0.05 to 0.15 per cent. against 1.4 to 2.0 per cent. in twenty-four hours). Taking these two characteristic properties of polystyrene into consideration, it will be realised that the plastic is of great interest to pharmaceutical chemists and perfumers. It can be used for packing many kinds of cosmetics and perfumery preparations, drugs, pastes and creams. Although polystyrene resin is more expensive than cellulose acetate, its specific gravity is 17 per cent. less (1.05 to 1.07 against 1.27 to 1.63) and therefore, weight for weight, is more economical. Polystyrene resin suggests itself as a material for moulding units intended for manicure sets, as it is completely unaffected by alcohol and acetone, and by the alkalis commonly used as cuticle removers. It may, in fact, be considered suitable for all purposes not involving contact with benzin, toluene, ethyl benzene, ethyl acetate, turpentine, carbon tetra-chloride and one or two lesser-known solvents. It is resistant to both weak and concentrated acids and alkalis, as well as to alcohol and The mouldings are more rigid than similar containers acetone. composed of acetate, though slightly more brittle.

Another plastic material with applications in packaging is methyl methacrylate resin—the most expensive of all those available in commercial quantities. It is available as a powder for moulding by injection and compression; as sheets for building-up ornamental boxes; and as rods and tubes for fabricating. The resin is characterised by extreme transparency, exceeding that of the finest glass.





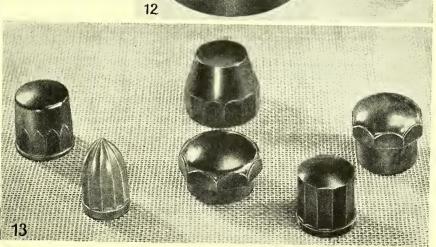


PLASTIC CONTAINERS

7. Bottle caps made by Streetly Manufacturing Co., Ltd., for International Bottle Co., Ltd. 8. Bottle closures issued by International Bottle Co., Ltd. 9. Cream and tablet containers; nozzles for collapsible tubes: Universal Metal Products, Ltd. 10. Cream and rouge containers: Mundet Cork Products, Ltd. 11. Moulded closures for toilet and perfumery products: Bluemel Bros., Ltd. 12. Tooth-powder box with screw-on lid: Insulators, Ltd. 13. Bottle closures: United Ebonite & Lorival, Ltd.







It is suitable for moulding containers to hold expensive beauty preparations, as its water-absorption is extremely low (0.05 per cent. in 168 hours), and it is not attacked by dilute alcohol, though softened by 95 per cent. spirit. Unlike polystyrene it is readily soluble in acetone and soluble in butyl, ethyl, and methyl acetates. Its specific gravity is 1.18, which is higher than that of polystyrene but less than that of cellulose acetate.

Phenol-Formaldehyde and Urea Resins.—Experience has proved that the phenol-formaldehyde resins are not suitable for applications involving prolonged contact with pharmaceutical and toilet products, but, in conjunction with properly selected "liners," are excellent for many types of caps and closures. Large numbers of bottle caps of these materials are used by manufacturing chemists every year, and for a wide range of products they give complete satisfaction, affording maximum protection, being easily removed and replaced, and affording a degree of decoration. Caps moulded of this type of resin, however, are not suitable for sealing jars and bottles containing toilet preparations that are highly sensitive to the presence of even traces of free phenol or cresol. One of the most interesting uses of phenolformaldehyde resins is for moulding novelty containers, which can be decorated with transfers, with engraved and wiped lettering, etc. Such mouldings are economical alternatives to metal and wood

novelties and deserve careful consideration by manufacturers assured of a large market for their preparations. They are available in dark colours and black only.

Under various names urea resins are well known to manufacturers. They are particularly suitable where mouldings in white or light colours are required. Caps and closures of urea-resin mouldings are used for sealing jars and bottles containing toilet and beauty preparations as well as for pharmaceutical products. Like the phenolic resins, those produced from a urea base are extremely stable, completely unaffected by alcohol and other common solvents, and have a low water-absorption figure (0·10 to 0·15 per cent. in twenty-four hours).

Cast Resins.—These offer another versatile material suitable for fabricating exclusive novelties. Unlike other resins they cannot be moulded but must be fabricated either in lead moulds or from tubes, rods and sheets. An extensive range of colours—transparent, translucent and opaque—is available. It is understood that only two cast resins are manufactured in this country, both having a phenol-formaldehyde base. One of them, issued under the trade name Catalin, is stated to be alcohol-resisting and therefore capable of being used for packaging perfumery and other articles containing spirit, as well as for weak acids. The moisture-absorption of the material is low (0·10 to 0·7 per cent. in twenty-four hours).

PROSPECTS FOR CASEIN PLASTICS

RECENT improvements in the casein-plastics industry and the possibilities of combining formaldehyde-hardened protein with phenolic or urea resins to form thermosetting moulding powders are discussed by George H. Brother in "Industrial and Engineering Chemistry" (32, I. 31). Casein plastic is the result of a reaction between casein and formaldehyde, and its commercial possibilities were first appreciated about 1897 by Adolf Spitteler, a German chemist. Considerable trouble was caused at first by the cumbersome process of production, which consisted essentially of dispersing the casein in an aqueous solution of an alkali, coagulating the dispersion with an acid or acid salt, pressing the wet curd into plates, and soaking the plates in formaldehyde solution. The industry was for a time entirely controlled by a German-French firm, Internationale Galalith-Gesellschaft and the product was called Galalith (milkstone). The firm still operates, and its product is so well known by the trade that galalith has become practically a generic term for all casein plastic material throughout the world.

Heat Plasticising of Rennet Casein.—During or shortly after the European war of 1914–18, it was found by investigators that rennet casein could be plasticised by heat and pressure if the total moisture content was about 40 per cent. In the "dry" process for manufacture of casein plastic, heat and pressure are usually applied in screw cylinder-presses, such as are used in the rubber industry for the extrusion of rods. The soft plastic is extruded as rods or tubes, according to the mandrel used. Dyestuff or fillers, as desired, are introduced with the water before plasticisation, and mottled or streaked effects are produced by mixing small pieces or "buttons" of previously formed soft plastic into the powder before extrusion. The rods and sheets of soft plastic must be hardened by immersion in a bath of aqueous formaldehyde solution of about 4 per cent. concentration for a period of about three weeks to six months, depending upon the thickness of the material. After hardening, the material must be dried to the normal moisture content of 8 to 12 per cent. The drying process requires about the same length of time as the hardening. Manufacture locks up an inordinate amount of capital, and is expensive quite apart from material lost by spontaneous fractures. Certain American manufacturers overcame most of the difficulties by combining the casein-plastics plant and the factory in which the finished products were made, with the result that waste was largely eliminated. Christensen, in 1929, found that alum, when mixed directly with the water before extrusion, partially hardened the casein, so that rods extruded from the mixture could be turned in automatic screw machines more satisfactorily than either the soft plastic or the formaldehyde-hardened casein plastic.

Improvements in Manufacture.—Attempts to improve the process of manufacture have mainly taken two directions, these being in the first place shortening the time of hardening by incorporation of a salt such as ammonium chloride or thiocyanate in the powder before extrusion, and substitution of a dormant hardening agent for the formaldehyde bath. The latter agents have usually been trioxymethylene, hexamethylenetetramine, or repressing agents such as formamide, dicyandiamide, hydroaromatic alcohols or ketones with formaldehyde. The object of all of such attempts was to permit the plastic to flow to shape and then for the protein

material to become hardened. None of the experiments was sufficiently successful to warrant commercial development. Recently it has been found possible to produce a thermoplastic formaldehydehardened protein material that may be formed to shape under the influence of heat and pressure and come finished from the die. The protein powder is treated with 40 per cent. formaldehyde solution so adjusted with alkali that the ph of the equilibrium solution over the protein will be that of the isoelectric point of the protein. The excess formaldehyde is washed out with water and the formaldehyde-protein powder dried to normal moisture content or less. The moisture content may be reduced to 5 per cent. or less, and a plasticiser, such as ethylene glycol, ethylene cyanohydrin, glycerin, etc., added. Acid casein was found to give better results than rennet casein by this treatment, the degree of hydrolysis appearing to affect the water absorption inversely. Even when up to 20 per cent. ethylene glycol was used as a plasticiser, the water absorption of this thermoplastic formaldehyde-hardened protein material was found to be less than the water-absorption of casein plastic prepared by the usual dry process, which was 18 to 25 per cent. Acid casein, hardened with formaldehyde and moulded with 15 per cent. moisture present, gave a water-absorption of approximately 10 per cent., while casein plastic with a moisture content of about 5 per cent. and ethylene glycol content of 15 per cent. gave about 15 per cent. water absorption. The length of all tests was twenty-four hours. This development is not of as great commercial importance as it would have been before the industry became so highly developed as it is today. Thermoplastic material must lend itself to injection moulding, and thermoplastic formaldehyde-hardened casein material is not sufficiently fluid to work in an injection machine, while no plasticiser has yet been found that will render it suitable for commercial utilisation.

Mixed Plastics.—Since their first introduction into industry many attempts have been made to combine casein with phenolic or urea resinous moulding compounds, largely in the capacity of filler material. Recent experiments, the results of which have not yet been published, indicate that the thermoplastic formaldehydehardened protein may be modified advantageously with either phenolic or urea resins to produce thermosetting moulding powders of considerable potential commercial interest. Mixtures of 50 per cent. formaldehyde-hardened protein with a moisture content of 3 per cent. or less, compounded with 25 per cent. phenolic resin and 25 per cent. wood flour, may be pressed at 330° F. and 2,000 pounds per square inch into unit pieces having good strength and closely resembling the regular phenolic material in appearance, except that they are more translucent. A good range of colours is possible, but they have not as yet been tested for light-fastness. The water absorption (about 3 per cent. in forty-eight hours) is higher than that of the regular phenolic plastics but less than that of any protein plastic material. This hardened protein material, mixed with an equal portion of urea resin, produces a powder which is thermosetting. A chemical problem arises from the fact that the formaldehydehardened protein gives an acid reaction when suspended in water. It has not been possible yet to neutralise the acid reaction of the hardened protein without the addition of so much alkali that the nature of the hardened protein has been adversely affected.

PHARMACY BEFORE PRINTING

A review of manuscripts and instruments evacuated from the British Museum on account of the war

By Geoffrey Rhodes

HILE it is interesting to think of the chemist in the ordinary course of business supplying drugs mentioned in the Bible and dispensing medicines used by the Druids, the fact is all the more remarkable when it is remembered that our first acquaintance with these remedies depended upon parchments copied out by hand before the era of printed books. A knowledge of early pharmacy is part of modern scientific practice, and it is a serious thought that the priceless manuscripts upon which it is based are now in greater peril than at any time in the past 1,000 years. That we are lucky enough to preserve them at all is due to the great care that has been bestowed upon them in past ages. They have been rightly regarded by each successive generation in turn as the precious title deeds of our treasury of learning. The most valued of all these documents and instruments are usually housed in the British Museum. The illuminated manuscripts dealing with the practice of physics are unique. They were collected 200 years ago (it would, of course, be utterly impossible to form such a library today) by the famous physician Sir Hans Sloane, and formed the nucleus of what is now in every respect the world's greatest library. At the commencement of the war this collection was removed from the British

Museum to what are hoped to be places of security, but in view of present circumstances it is impossible to predict the future fate of these treasures. In the light of this fact it has been thought timely to place on record these notes on early pharmaceutical practice which are based on a close study of the historical material now unfortunately no longer available for research.

The Earliest Remedies .- The starting point, it seems hardly necessary to say, of all pharmaceutical inquiry was the first operation in the human mind of the same biological instinct that impels a cat to eat grass. The feverstricken savage snatched at a juicy fruit to quench his thirst and his wounded brother pressed a cooling leaf to his injury. In course of time, certain fruits and particular leaves were found to be more efficacious for the purpose than others, and so the serious story of herbs began. Researches into the healing properties of minerals came later, and we find that an African scholar in classical times mentions the "echo" as a remedial agent. The first idea of the cause of an echo was that it was the property of a special kind of stone,

de hour. orbe Stadissigny radio aum potenta alpla omnes trumore flatim francic & glanar. cribe Seculis agree udir am refina rerebenana diligencer crica & appoints; on § Lachucamtepormă collectiones rumpines planaci capial camp, fub capite febricains arbe Chamaril ponas infirmo tam neforence cemeamarı fucul mundillimit er nemer a carum pungel more up mollillime redacta-cum aq methen a coopiel allum dalagene catida mire parregonêm prestar. fi ror fiedauerio ferro cum une: erta fi cor non fiedatite epidicabreue Camedrif in puluerem Some dibif a someon called bibere mollifimű relach. s in uine ue teri pour data: omne uenemi fmaffirme difference erect.

Medicinal plants illustrated in the Harlean manuscripts, British Museum

and no doubt an early pharmacist suggested the use of that echo stone in some form or other as a drug. A study of the papyrus found in the ancient Egyptian tombs shows that the subjects of the Pharaohs had an intimate knowledge of the use of spices and balsams, and other drugs, such as preparations of lead and salts of copper, are also referred to. That they had the means to measure

and compound these substances is plain from a curious passage in a prayer in the "Book of the Dead." The following words are found on the papyrus in a plea put into the mouth of the deceased as he appears in the next world. "I have not added to the weights of the scales, I have not misread the pointer of the scales."

Persistence of Magical Medicine.-All this, it will be noted, has to do with perfectly legitimate pharmaceutical practice, and the first thing to do in discussing the subject is to throw Jonah in the form of the alchemist and his pentacles overboard. He has encumbered the scene too long. The magical side of medicine unfortunately persisted well into the era of printed books; witness the absurdities of Paracelsus as late as the sixteenth century. Paracelsus had a wide and successful practice of a kind, but fable relates

that his career came to an abrupt end, when he was flung over a cliff by the doctors and apothecaries whose patients he had stolen! The school of necromancers are credited with certain important discoveries, discoveries, but a close study of history suggests that the earliest investigators had little time or inclination to commune with spirits, good or bad, although in all ages there have been



Old woodcut of statue of Sir Hans Sloane made for Chelsea Physic Garden

quacks who found it easier to appeal to their patients' fears than to their reason. There has never been any serious suggestion of any double-dealing on the part of Maimonides who lived and practised as early as the twelfth century; in spite of fabulous and impossible stories about him he will ever remain one of the great figures of all time. Born in Cordova, he died at Cairo at seventy years of age, and few men have done so much for their contemporaries and handed on such a wealth of knowledge to future generations, and this in spite of the handicap of living and thinking amid the primitive ideas of his day, from which he was not entirely free. He was, of course, a Jew, and his official position was court-physician to the Saladin of Egypt. Nor was there ever any mumbo jumbo about Jesuit's bark, which was afterwards named cínchona, after a Countess Chinchon, wife of a ruler of Peru, whose life it was claimed to have preserved. The chemistry of quinine was, of course, not understood for hundreds of years after that, and the alkaloid did not come into general use until about a century ago. A famous branch of pharmacy that makes strange history is the preparation of poisons. It seems doubtful if at any time this work was carried out in the full light of day, but that it was a definite part of dispensing is fairly clear from the fact that as late as the close of the eighteenth century an official "physician-poisoner," if such a term may be used, was appointed to one of the German Courts. The distillation of lethal drugs is frequently mentioned by the Greek and Roman writers, and the extent to which poisons were used to take life in the Middle Ages is only too well known. At one time

in Italy a vial of a colourless, odourless and tasteless fluid, which was at the same time a potent poison, was part and parcel of every fashionable lady's dressing table equipment. A cabinet formerly belonging to the Medici family was sold in London a few years ago, with, it was alleged, the original vials of poison, as supplied by the Florentine apothecary.

GREEK AND ROMAN PHARMACY

The first serious study of drugs of which we have any definite knowledge is recorded in the various manuscripts attributed to the Greek Hippocrates—called the father of medicine—working about 460 B.C., in the days when the Jews under Ezra returned from Persia to their own land. He was the first philosopher to ignore mythology and superstition, and to rely entirely on observation explained by common sense. In this way he determined the practical value of some 265 remedies. His work was the basis of all later Greek and Roman physic and provided the inspiration for the

Mandrake. (From the Sloane manuscripts, British Museum)

Arabs working 1,000 years later in the same field. Diet was considered of importance in the Hippocratic system, and his followers developed the sensible idea, latent in all the masters' works, of studying food, exercise and natural measures in all persistent cases. Theophrastus employed the methods of Hippocrates in the study of botany, and in due course added to the work already done in pharmaceutical research. Galen (A.D. 150) is the next really outstanding figure; he was the Roman physician who is chiefly remembered today as the

bered today as the inventor of cold cream. A thirteenth century copy of Galen's "Compendium Medicinæ" is one of the few manuscripts still at the British Museum, and his works were widely read and followed in all European countries during the Middle Ages. Galen's use of drugs was mainly empiric, and

he recognised in his prescriptions the same characteristics—heat and cold, dryness and moisture—as he thought he found in the human body. He used to a great extent the theory of like curing like. All the early investigators were led away by specious explanations of the results obtained, but happily these did not obscure the practical value of many of their remedies. The early physcians, who advised their patients to take the physic ordered them at a lucky hour on a sunny day, were by no means detracting from the healthful effect of the drug, although the suggestion may appear foolish to the modern mind.

ARAB MEDICINE

After the fall of Rome, when western learning suffered such a serious eclipse, the Arabs held the torch aloft, and in Bagdad in the eighth century the story of pharmacy proceeded under the direction of the Caliphs. As Gibbon, the historian, relates:—

"The science of chemistry owes its origin and improvement to the industry of the Saracens. They first invented and named the alembic for the purposes of distillation, analysed the substances of the three kingdoms of nature, tried the distinction and affinities of alkalis and acids, and converted the poisonous minerals into soft and salutary medicines."

Some idea of the wealth and influence of Arab medicine may be learned from the fact, also reported by Gibbon, that a private doctor was obliged to refuse an invitation to attend the Sultan of Bokhara because the carriage of his books would have required 400 camels. The Arabian colonies in Africa, Spain and Italy absorbed the heritage of Greek and Roman medicine, and the outcome of this treasury of pharmaceutical knowledge was the inauguration of the famous school of pharmacy at Salerno in Italy. This was the first attempt to found a college for such studies in Western Europe, in the dark days following the sacking of Rome. The Normans established themselves on the Italian coast at that time, and William the Conqueror is counted among the historical personages who resorted to Salerno in search of health.

The Philosopher Avicenna.—One of the greatest Arab philosophers of this time is Avicenna, whose works determined the course of medical studies in the European universities from the twelfth to the seventeenth centuries. He was born in A.D. 980, in Bokhara, and after a life of many vicissitudes, during which he completed his course of medicine under extreme difficulties, he ended his days in the peaceful occupation of scientific adviser to the Prefect of Ispahan. Avicenna's "Canons," compiled before the Norman conquest, was still used as a text-book at the university of Louvain in 1650. It is alleged that the Arabs added little in the knowledge of surgery to the work already done by the Greeks and Romans, but in the sphere of pharmacy they are outstanding figures. Their association with the Far East brought them into contact with the ancient civilisations of India and China, and in this way they became possessed of important new drugs of value in modern practice. Their skill in chemistry helped them to an understanding of both organic and inorganic substances, and was the basis of the therapeutical use of drugs. It is claimed that the Arabs compiled the first pharmacopæia and opened the earliest chemist shops. A work entitled "De Simplicibus," credited to an eleventh-century Damascus author, was the authority for the preparation of the first English Pharmacopæia, published by the College of Physicians in the time of James I.

Arab Pharmacy.—Someone has said that morals are a question of locality. This geographical idea can certainly be applied to Arab pharmacy. The Arabs as a people arose in the centre of ancient learning, with the doors of famous colleges open to them, with access

to the great libraries, and this at a time when Western Europe was still struggling to rise above heathendom. When perhaps only half a dozen useful herbs were available to the Saxon apothecary, the Arabs had the magnificent tropical flora to draw upon. Caravans from the East brought the wealth of China and the Indies to Bagdad, and spices, perfumes and gums were pounded and distilled in the East, when the common medicaments were practically unknown in these islands. Every young Arab student possessed books and chemical appliances when such aids to learning were the greatest rarities in England. The last portrait in this great gallery of workers in the field of eastern physic, is the Hebrew scholar already mentioned, Maimonides of Cordova, and with him we pass to the universities founded by the Church in the Middle Ages. The Oriental chemists retired from the scene; they had taught us all they knew. The value of their contribution is universally acknowledged today.

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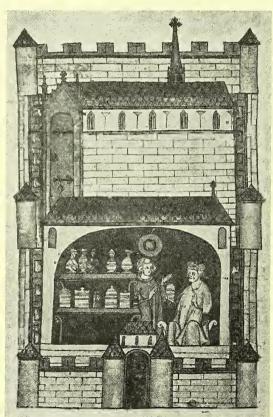
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An apothecary's shop in the Middle Ages. (From an illuminated manuscript in the Sloane collection of manuscripts in the British Museum)

THE MIDDLE AGES

As may be imagined, the collection of illuminated manuscripts dealing with the preparation and use of drugs in mediæval times includes some of the most valuable books in the British Museum. These have been removed with the rest of the Sloane manuscripts to a place of safety, for the duration of the war, but the method of protection is not, of course, divulged. Some of these books are copies of works compiled in ancient times, and others are original, the work of scholars, chiefly monks, who studied botany and chemistry under the limited conditions of their times. The majority of

the manuscripts are in Greek or Latin, but occasionally one comes upon a work in Italian or French, or even in English. Manuscripts were written mostly in either the running or cursive hand, upon which modern handwriting is based, or in the upright book hand. Many of the Sloane collection are in the ornamental hand used for books for the libraries of wealthy or noble persons.

Books in the Middle Ages.—The scribes and booksellers who copied and disposed of these manuscript volumes were usually attached to the European universities, and it has been estimated that over one hundred different works were in circulation in the Middle Ages in Europe, and of these religious, and what would now be termed scientific, works were the majority. The great wealth of the Dukes of Burgundy enabled them to spend lavish sums on such books, often illuminated with plates of solid gold in the pictures, and the libraries of Brussels, Antwerp, Bruges and Ghent still contain volumes executed in those days dealing with herbal remedies.

But one of the most interesting of all the existing manuscripts of this period is a text-book by an Englishman, Gilbertus Anglicus, the "Compendium Medicinæ," the first English text-book of physic

known, and one which in its day had a European reputation. A contemporary authority says that this work was a fine example of the practical outlook and methods of the active-minded English race. A very fine fourteenth century copy of this work in splendid preservation is still on view in the Kings Library of the British Museum. The observations on leprosy in this work are said to be still quite sound.

Empirical to Scientific Methods.-During the next century several scholars at Oxford and Cambridge wrote books on physic and herbs, but they may be fairly described as "rub-bish," in fact it was not till after the revival of learning and the discovery of printing that ancient medicine recovered its lost ground and the solid work of Hippocrates, Galen and Avicenna set a standard again. Most of the monks of the Middle Ages worked entirely from books, and the antiquity of the volume was supposed to establish the truth of the contents; in this way fabulous remedies and legendary practices were handed on from century to century. Most of the drugs recommended did not exist in nature at all, the patient being sent to a magician to procure them, in place of an apothecary. What nostrums these charlatans compounded to represent the formula prescribed no one today can even guess. entific methods of Hippocrates and Galen, however, slowly gained ground,

and those truth-seekers in the Middle Ages who followed the lead of these two great men laid the foundation of modern dispensing. These sincere workers, perhaps without knowing it, were logically following in the steps of the savage who dressed his wounds with spittle, for which method we have august authority.

Ancient Dispensaries.—It is not difficult from the illuminations in the manuscripts and the instruments and pharmaceutical equipment which has been preserved, to reconstruct an ancient dispensary, and follow the gradual evolution of the modern chemist's shop. The excavated Greek and Roman cities show that the ancients had splendid marble drug stores with useful counters and shelves designed with sunken spaces to secure the bottles and jars of medicaments. The Greek and Roman apothecaries' equipment evacuated from the British Museum includes a collection of balances, forceps, phials, salve pots and boxes, made with all the precision of modern workmanship. The Roman dispensary cases made of metal with compartments for the various drugs closed with sliding lids and countersunk ring handles, illustrate most of the principles of design still in use for such purposes. The ancients understood, of course, the art of turning, and the chemists' boxes in wood or ivory are the equal of any box which might be made in that manner at the present time. In the same way glass phials and the larger bottles, if not of such clear crystal, show all the usual features of the modern article. Broadly speaking, the apothecary's shop in ancient times and in the later centuries of the era before printing, had much in common. The London hospitals and medical museums possess many examples of equipment of ancient chemists' shops, and it is not necessary to go further afield than Bruges to see a mediæval dispensary still functioning as in olden days. St. John's Hospital, in the old Flemish city, has dispensed medicines for over 700 years, and the vaulted wards date from the time when two patients occupied a bed. A huge pestle and mortar in the centre of the dispensary worked by a pulley and chain suggests the time when medicine was given in big doses, being served out to the sick with a large ladle from a pail. At the time of the Great Plague in England, a compound of figs and almonds, a rather pleasanter tonic than most of that time, was a public issue and the authorities advised that it should be prepared in such a way.

Early Medicaments.—There is a remarkable diversity in the kind of medicine recommended in the works of the early pharmacists.

On the one hand there were loathsome compounds like moss off a human skull, and these remedies persisted until the eighteenth century. This very prescription is mentioned in the revised Pharma-

copœia of 1721, while as a more pleasant counterpoise to these noxious draughts there were all the fruits and sweetmeats of the dinner table which were originally valued chiefly for medical use. The word "Confection" explains this history of these "drugs." Cardinal Wolsey carried an orange, the rind studded with cloves, to ward off fever, and the almond and fig mixture has already been referred to. Wine hot, cold, at full strength or with water, was a remedy for nearly every ill according to the surgeongeneral in the army of Charles II. Fruit preserve made with honey, before sugar came into use, has always been considered what would now be called a "blood mixture." This side of dispensing offers an interesting study by itself, and an examination of old documents suggests that "nature's way," or the consumption of what we call dessert, is a very old practice on purely medical grounds. It must be remembered that the fruit and preserves that are now found in the humblest house were originally great luxuries, and may well have first found favour as medicaments.

The Origin of Cold Cream.—Butter is another case in point. And an interesting illustration of the development of pharmaceutical work is the story of the change-over from the use of this dairy product for external medical application to the employment of cold cream. In the time of Hippo-

crates butter as an article of diet was a luxury only seen on the tables of kings. Hippocrates advocated its use as an ointment and explained this method of preparation in the following words:—

"The Scythians pour the milk of their mares into wooden vessels, and shake it violently; this causes it to foam, and the fat part, which is light, rising to the surface, becomes what is called butter."

Upon the recommendation of Hippocrates butter was used as a salve for hundreds of years until Galen, alive to its disadvantages for medical purposes, set himself to improve on butter as an unguent and bequeathed us his prescription for cold cream.

Changing Methods of Taking Medicine.—Finally, on the question of the methods of taking medicine in vogue at different times, if the preparation was not liquid then the idea of forming it into a pill, to be easily swallowed by the patient, must obviously have been a very ancient practice. This idea is supported by the fact that trays and spatulas for rolling pills have been found which are of great antiquity.

In the mind of the lay public tablets are often regarded as synonymous with pills—a misconception that becomes apparent if the derivation of the words is understood. Pill is an anglicised form of pilla, a diminutive of the Latin word pila, meaning a ball. In the word tablet (Latin tabula) the conception of flatness is inherent, though in recent years some looseness of usage has been discernible on the part of manufacturers of pharmaceutical preparations.



In opposition to this nonsense the scientific methods of Hippocrates and the Greek and Roman room, British Museum)

PHARMACY IN THE ROYAL NAVY

HERE are no pharmacists serving as such in the Royal Navy. In the senior service, pharmaceutical work is in the capable hands of a number of pharmacists whose names appear on the Navy List, but who are actually civil servants of recognised status. Their professional duties may conveniently be divided into three main branches: (1) The supply of pharmaceutical and medical equipment to the ships of the Royal Navy; (2) the training and examination of certain naval personnel for modified pharmaceutical duties afloat; and (3) general hospital dispensing. These and many other activities connected with naval pharmacy were described to a representative of The Chemist and Druggist during a recent visit to a large naval hospital in the South of England The pharmaceutical staff of this hospital consists of a superintending pharmacist, a senior pharmacist, and six pharmacists. In addition, there is a clerical staff of seven and a packing staff of twenty.

Equipping Ships.—This is the most important part of the naval pharmacist's work. Medical supplies for H.M. ships are assembled and dispatched from the pharmaceutical departments of the large naval hospitals, and the work, in present circumstances, is carried

on at full pressure. It is not difficult to appreciate the many problems connected with the assembly of a multitude of articles from all over the country, their examination, repacking, and dispatch to widely scattered units. The need for economy in space on board ship is met by ingenious packing methods, and each equipment sent out represents the maximum amount of essential materials that can be packed into the minimum storage space. During a tour round the various departments, stores of all kinds were noticed, including serums, dressings, medical comforts (such as brandy, invalid foods, and the like), instruments, drugs, x-ray films, etc., all of which eventually find their way into service. The cases for use afloat are of varying sizes, described as Nos. 1, 2, 3, and so on, and the size and number of cases sent out depend on the type of ship being equipped. Thus, for a destroyer of medium size, one

of the smaller cases might suffice, while, for a battleship, several of the largest units would be required. Once aboard, each case represents a pharmacy in miniature, taking up little room but ready for practically any dispensing or surgical purpose.

The filling of cases intended for use on ships on active service is carried out in a long basement room, the drugs and other supplies being stored in racks within easy reach of the packing staff. gerous drugs are kept in a locked room. The cases, which are stoutly constructed of wood, reinforced with metal corners, are designed to accommodate layers of trays, each tray being partitioned so that bottles of various sizes can be adequately protected against breakage; the bottles are further secured by packing with tow. A diagram, showing the contents of the cases at a glance, is pasted inside the lid. Several cases of a different type, reminiscent of those used by explorers and travellers, were noticed, and the information was given that these particular equipments were field chests for use by landing parties. These cases are light, extremely robust, and fitted with strong rope handles for easy transportation. Many neat cases of surgical instruments were also being packed for service.

It was interesting to learn from the superintending pharmacist that the supply of medical equipment to naval vessels and fleet air arm stations is carried out on a business-like basis. Anything from a simple first-aid case to a complete portable dispensary may be supplied, and each item is invoiced to the ship, which must account for all material used up in service. Unused equipment is returned in due course to the hospital, where it is carefully examined and either certified for reissue or condemned.

The Training Scheme.—One of the most interesting features of naval pharmacy is the training given by the hospital to certain naval personnel for subsequent service affoat. The men concerned

enlist in the sick-berth staff of the Royal Navy, and spend part of their probationary period at the hospital, where they undergo a brief course in pharmacy and dispensing. This course, which includes lectures and practical work, lasts for about three months. or longer if necessary. The men are examined by the pharmaceutical staff at the hospital and, if successful, are passed into a higher grade. They are further examined for each promotion up to the rank of Chief Petty Officer. When the men pass out after training they are able to perform modified dispensing duties on board ship. We were informed that every "sizable" ship carries one sick-berth rating trained in pharmacy—large vessels generally two.

The examinations conducted by the hospital pharmaceutical staff cover a fair amount of ground, as will be seen from the following specimen questions, taken from papers which were set recently The tests give a fair idea of the standards reached in the comparatively short period of study.

r. Calculate the quantities required for the following:

(a) 3x of 10 per cent. solution of chloroform in ether; (b) 3 iv of 5 per cent. solution of cocaine hydrochloride in water;

(c) 4 oz. of zinc oxide 20 per cent. in boric acid;

(d) $\frac{1}{3}$ viij. of hydrarg. ammon. $7\frac{1}{2}$ per cent. in ung. zinci.

2. Write notes on the dispensing of (a) emulsions; (b) suppositories.

3. Calculate the quantities for the following:

John Brown, P/O H.M.S. Blankshire. 22/12/40.

R Cocain. hydrochlor., gr. 1/10. Syrup. aurant., ad 5j. Ft. mist. Mitte 3ij. Sig.: 3j p.r.n. R. N. Jones, Surg. Lieut., R.N.V.R.

Is this D.D.A.? Describe form M 177A. Draft a specimen form and make the necessary entries regarding the above prescription.

4. (a) Convert \(\frac{5}{5}xxv\). to avoirdupois. (b) Calculate the quantities required for \(\frac{3}{5}iv\). of a dusting powder containing \(\frac{5}{5}\) per cent. iodoform in zinc oxide. (c) How many tablets each containing gr. 8.75 hyd. perchlor. are required to make one college of the acceleration (d) How. gallon of a 1/1000 solution. (d) How much zinc, sulph, would be required to make 3x. of a 2.5 per cent. solution?

Mr. E. L. H. Shute, M.P.S., Superintending Pharmacist

5. How would you dispense the following? Calculate quantities required and write labels. (a) R Bismuth. carb. Sodii bicarb. gr. x. gr. xij. M vij.

Spt. chlorof. Aq. ad Mitte $\frac{3}{5}$ viiij. Sig. $\frac{3}{5}$ j s.o.s.

gr. 80 M 20 (c) R Potass, chlorat. Ac. hydrochlor. Zviij. Aq. ad Ft. garg. Sig. gargar. q.h. (b) R Sodii bicarb. Tinct. gent. co. m. 10 Ol. menth. pip. $m. \frac{1}{2}$ Spt. chlorof. Aq. ad Ft. mist. Mitte 3×1 . Sig.: 3×1 . i.d.a.c. ex aq. 3ss. (d) R Ol. olivæ

Aq. ad Ft. emuls. Mitte 3iv. 3ss. omne nocte.

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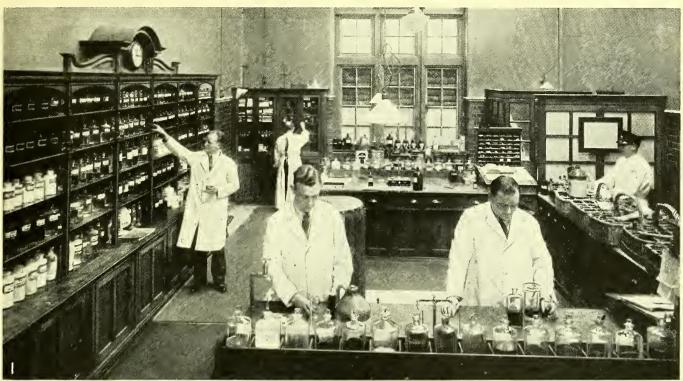
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6. Give the doses and uses of the following: - Spt. ammon. aromat.; tinct. nucis vom.; ext. belladonnae; chlorodyne; quinine hydrochloride. 7. Give definitions of the following: - Cachets, ampoules, capsules,

The Dispensary.—As the illustration of the dispensary shows, this department is equipped on orthodox lines, and is, in fact, no different from the dispensaries of the large civilian hospitals. Apart from the routine hospital dispensing work (the ward baskets can be seen on the counter to the right of the photograph), the dispensary is also used as a training centre. Attached to the dispensary are the superintending pharmacist's office and the general office, the latter under the charge of the senior pharmacist. Both offices, in view of the large amount of medical stores supplied by the hospital to H.M. ships, are scenes of considerable activity. As a matter of interest, it may be mentioned that the pharmaceutical department is responsible for the general supplies of the hospital, including such items as surgical instruments, blankets, utensils, linen, etc. Hospital supplies of soda water and lemonade are manufactured on the premises.







PHARMACY IN THE ROYAL NAVY

1. The dispensary, used both as a training centre and for routine hospital dispensing work. 2. Packing with medical equipment the cases for dispatch to units afloat. 3. No.1 medical equipment case being packed; note the diagram inside the lid showing the contents of the case. 4. The general office: A constantly busy department under the charge of the Senior Pharmacist. 5. Making soda water for hospital use.

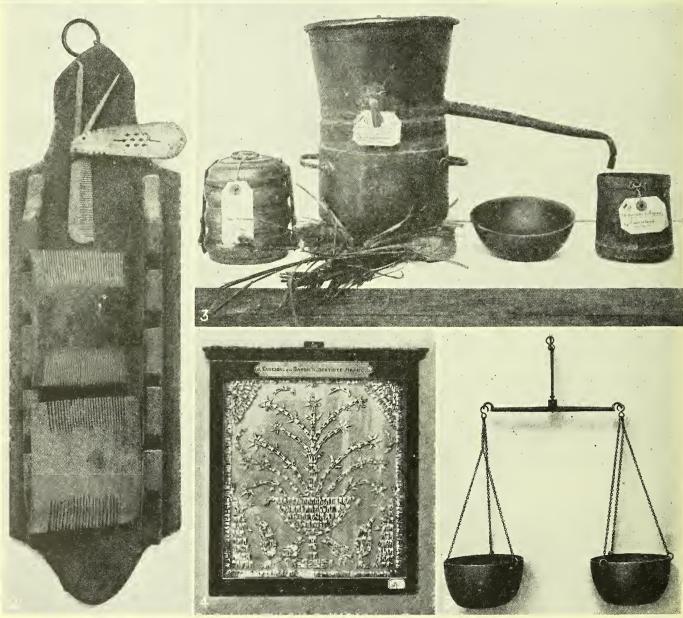




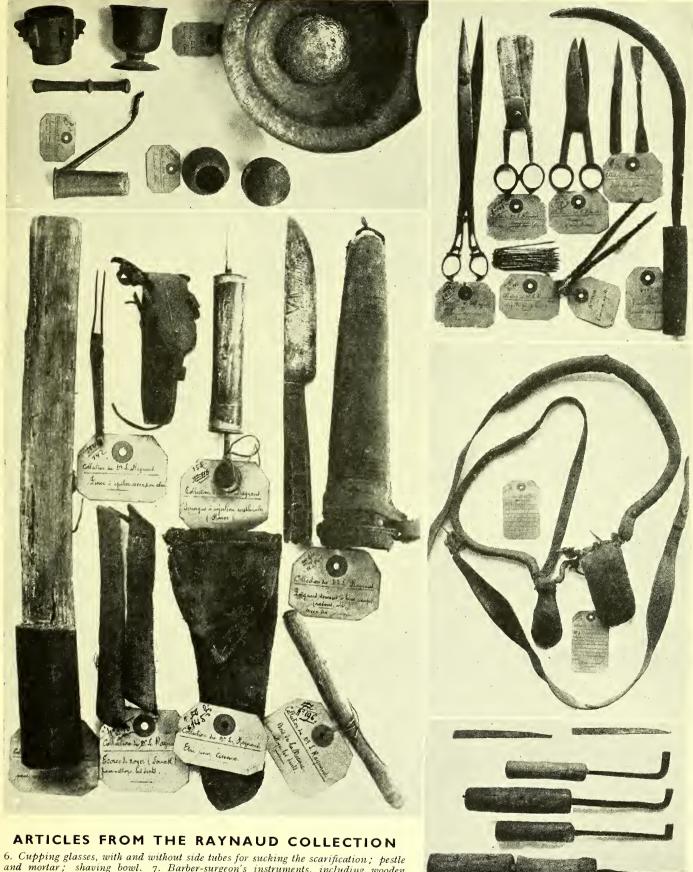
THE RAYNAUD COLLECTION



R. LUCIEN RAYNAUD, prior to his death on September 4, 1931, was Inspector-General of Public Hygiene in the French North African possessions. During his term of office he gathered together a collection of surgical instruments, pharmaceutical apparatus, and toilet accessories of local (chiefly Moorish) origin. The collection was dispersed after his death, but many of the objects were of unique interest, and photographs of them are here reproduced by permission of the collector's daughter, Madame Altairac.



1. Soft soap and sprinkling bowls for use at Turkish baths. 2. Comb-tray and toilet combs. 3. Primitive still for distilling essential oil from orange flowers, etc.; group of native measures. 4. Signboard (made from teeth), of native barber-dentist. 5. Native herbalist's hand balance.



6. Cupping glasses, with and without side tubes for sucking the scarification; pestle and mortar; shaving bowl. 7. Barber-surgeon's instruments, including wooden razor-strop, urethral syringe, razor, teeth-whitening bark, etc. 8. Circumcising scissors, lancets, epilating tweezers, etc. 9. Trusses. 10. Trepanning instruments.

THE GERMINATION OF ERGOT

By T. C. Denston, B.Pharm., A.I.C., Ph.C., F.L.S.

RGOT is defined in the British Pharmacopœia as the "sclerotium of the fungus Claviceps purpurea Tulasne, arising in the ovary of Secale cereale Linn." It is thus a particular fungus collected at a particular stage of its development from a single plant, namely rye. Actually, a large number of other grasses are liable to attack by one or other of the several species of Claviceps, of which at least eight are indigenous to Europe. Claviceps purpurea is distinguished by the characters of the stroma, and to a less extent by the

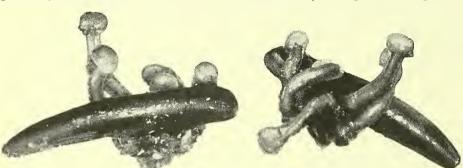


Fig. 1 (left). Ergot sclerotium with cluster of half-dozen stroma. Fig. 2. Development of stroma from lower surface of sclerotium.

colour, shape, and size of the sclerotium. Rye flowers are particularly liable to this fungal infection, because the plant requires crossfertilisation, which means that the glumes must be open to expose the stigma and anthers—and in adverse weather conditions they remain open for a long time. It is then that air-borne spores of the fungus enter. Wheat, on the other hand, is self-fertilised; its glumes remain closed in cold weather and even on warm days open for only about a quarter of an hour, and so it is far less susceptible to infection.

The official synonym "Ergot of Rye" is of some significance, since the fungus is known to have been collected from other grasses and the activity of such sclerotia is not necessarily identical with that of the products taken from rye. It is, in fact, established that ergot from Festuca pratensis contains the alkaloid ergotamine, which is not present in ergot of rye.

Collection of the Drug.—Ergot is collected from fields of rye when the sclerotia are fully developed and projecting from the spikes of grain, or alternatively the sclerotia are removed by sifting from the grain after collection. The Spanish and Portuguese drug is harvested in July or early August and, in normal circumstances, Polish is gathered about a month later. The size of the crop varies considerably according to weather conditions. A wet spring favours development of the spores of the fungus (see below); if a spell of dry, windy weather follows, the spores are likely to spread extensively. Most important are the weather conditions during the few days the rye plant is in flower. If, owing to unfavourable weather, pollination does not readily occur, the glumes of the flower remain open and the chances of infection are increased. Strong winds and heavy rain in the harvesting season cause heavy loss due to the sclerotia falling to the ground.

Life History of the Fungus.—The ergot of commerce is the dormant stage in the life cycle of the fungus, termed the sclerotium. It develops in the summer months as a cylindrical or somewhat triangular projection from the ears of rye, tapering towards both ends and usually somewhat curved. The length varies from 1.5 to 4 cm.; small sclerotia appear to contain a higher percentage of alkaloids than larger ones. Longitudinal furrows frequently run almost the full length of the concave side, and the outer surface is dark violet to black. When broken across, the outer part shows a dark purple colour, within which is a narrow, pale-blue zone and in the centre a dingy white or pale pink; darker, or sometimes paler, lines may be seen radiating from the centre.

Under natural conditions the sclerotia fall to the ground, become lightly covered with a layer of soil and remain unchanged throughout the autumn and winter. In the spring, germination occurs, but it appears essential for the fungus first to pass through two or three months at a low temperature, followed by a period of higher temperature. Germination commences by rapid multiplication of certain sub-cortical cells, causing the sclerotium to bulge and finally burst

under the pressure of the interwoven hyphæ. These grow out into a stalk, or stipe, from the apex of which thinner hyphæ radiate to form a knob or capitulum; the entire structure is called a stroma. Further reference is made below to this stage of the fungus. The stroma push upwards, in nature often through a thin layer of soil, by longitudinal growth of the stalks, which, like the heads, change colour through pale yellow and red to purple. The stalks are about ½ to 1 in. long, but elongate in the dark, i.e. when more deeply buried in earth. The base of the stalk is

somewhat thickened and there surrounded by a network of secondary mycelium. When fully developed, the surface of the heads is covered with minute warts, each covering an elongated, pear-shaped cavity termed a perithecium. From the base of each perithecium arise many asci (spore cases), each containing eight filamentous ascospores. The apical cells of the perithecium degenerate, the asci are ruptured and, on account of the pressure caused by the swelling of the neighbouring mycelium, the ascospores are shot out to a height of several inches. They are light bodies, about 60 microns long and 0.6 microns in diameter, and consequently readily carried by air currents. It appears that ascospores are also distributed by slowly emerging in a mucilage at the mouth of the perithecium and being carried

thence by insects. So, by these two agencies, but especially by the former, the ascospores of the fungus are carried to the stigmas of the rye flowers. If the apical flowers of a spike are not fully developed when the fungus alights, they may still be attacked, because in this region the glumes are never perfectly closed. Even under the most favourable conditions for the fungus only a very small proportion of the immense number of ascospores produced find their appropriate host. The spores on the flowers soon germinate by forming germ tubes, which grow into a mass of hyphæ, termed a

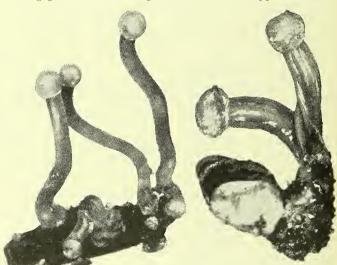


Fig. 3 (left). Developed stroma with elongated stipes. Fig. 4. Sclerotium cut transversely to show mass of mycelium.

mycelium, and this grows down the outside of the style and ovary. At this stage the fungus is termed a sphacelia. About the same time the host secretes a sugary liquid called honeydew, and the hyphæ of the mycelium form, by terminal abstriction from lateral branches, an immense number of asexual spores called conidia. The fungus now has the appearance of a soit, dirty-white, slimy mass. The honeydew, with conidia in suspension, is carried by insects or drops on to the lower flowers, leading to a secondary infection of the plant about a week after the primary infection with spores (ascospores). Rain or dew dilutes the honeydew, and in about a day a new mycelium develops. The fungus then enters the ovary at the base and destroys it. Later the hyphæ form numerous new branches,

divide by transverse walls, increase in thickness, and by mutual pressure form a hard mass termed pseudo-parenchyma. At the same time a narrow cortical portion is formed, consisting of closely-packed parallel hyphæ with a violet or black appearance due to the deposition of colouring matter. The mass becomes elongated and, in the late summer, with its apex surmounted by remnants of the pale sphacelia, protrudes from the spike. The life cycle is thus completed.

Experimental Germination.—It is generally held that ergot sclerotia which fail to germinate within one year will not do so subsequently. Rotation of crops is an established practice for ridding rye fields of the fungus and keeping them free. In experimental germination it is therefore essential to use sclerotia of the previous harvest. This was done last autumn with a Spanish sample of good commercial quality. Many of the continental authors who have studied germination refer to the necessity of exposure to a low temperature, and small numbers of sclerotia were consequently kept in a domestic refrigerator (temperature approximately 36° C.) for periods of one to five weeks. Batches were then placed on sand and on a fine porous soil with a similar thin covering. The ergots must not be deeply buried or germination will not occur. Indeed, deep ploughing is a recognised method of extermination of the fungus in rye growing. Some sclerotia were watered at intervals and left exposed to rain; others were placed in a sheltered position.

Germination occurred in the specimens in wet sand about the middle of April. Sclerotia kept in drier conditions entirely failed to germinate. No effect could be detected from variations in the duration of refrigeration, probably due to the exceptional and prolonged cold of the winter months of 1939–40.

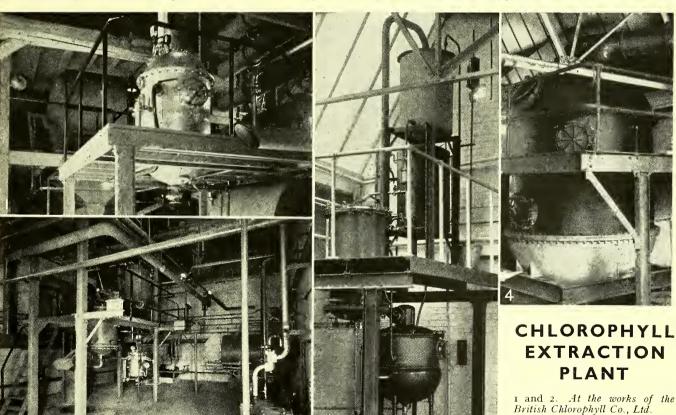
The characters of the germinated sclerotia are illustrated opposite. Fig. 1 shows an ergot with a cluster of some half-dozen stroma. Numbers as great as sixty are referred to in the literature, but the largest found in these experiments was twelve. Fig. 2 shows the manner in which the stroma develop from the lower surface of the ergot and then curve round towards the light. Fig. 3 shows three developed stroma with elongated stalks (stipes)—an effect produced in ergot well covered with soil or otherwise shielded from the light. This illustration also serves to show that, given favourable conditions, broken ergots will germinate satisfactorily. For Fig. 4 a sclerotium was cut transversely to show the mass of mycelium at the swollen base of the stroma, as well as the curvature of the stipe. The warty nature of the surface of the capitulum should also be noted, a condition which intensifies as the spores ripen. The heads were at first pale buff, but gradually acquired a pink colour, while the stalks became a deeper purplish red. The stroma are delicate structures, shrivelling on drying, so that the photographs had to be taken rapidly and without delay.

CHLOROPHYLL

HLOROPHYILL, the green colouring of leaves and stems, is contained in the chloroplasts which are universally present in green plants. The pigment itself is variously stated to be dissolved in some oily substance which is held in the channels and meshes of the plastids or to exist in the form of a precipitate. It is present in both green and brown algæ and also in leaves having a

temperature, as well as the presence of certain substances such as iron and magnesium, is essential.

The photosynthetic activity possessed by all green plants is dependent on chlorophyll, which, in presence of absorbed light, effects the conversion of carbon dioxide and water into the primitive carbohydrate unit and free oxygen. Neither the exact course nor



purple or red hue, where it is masked by other pigments. Only a few of the lower plants, e.g. fungi, are able to survive without chlorophyll. The substance plays an important part in the life of the plant and it has been likened to hæmoglobin of the blood. With regard to the conditions necessary for the formation of chlorophyll, light is the most important but, in addition, a certain degree of

the mechanism of the transformation is known, but it is suggested that the carbon dioxide first unites with the magnesium atom in chlorophyll to produce an unstable acid carbonate, which is then reduced to formic acid or formaldehyde:—

3 and 4. At the works of William Ransom & Son, Ltd.

 $R - \text{Mg.O.C(O).OH} + \text{H}_2\text{O} \rightarrow R - \text{Mg.OH} + \text{H.CHO} + \text{O}_2$

The elucidation of the chemical constitution of chlorophyll has been the subject of considerable research by many workers, notably Willstätter, who was awarded the Nobel prize for his work in this field. He proved that chlorophyll consists of two closely-related substances, chlorophyll a and chlorophyll b, in the proportion roughly of three molecules of the former to one of the latter. The following formulas have been assigned to the two components:—

 ${
m C_{55}H_{72}O_5N_4M_9}$ Chlorophyll a (blue-green) $C_{55}H_{70}O_6N_4M_9$

Chlorophyll b (yellow-green)

From its constitution chlorophyll may be regarded as the methylphytyl ester of a tricarboxy magnesium porphyrin. The structure of the chlorophyll molecule can be seen from the accompanying formula in which P represents the phytyl radicle, C_{20} H_{39} , which, on hydrolysis of chlorophyll, is liberated as phytyl alcohol. Phytol is a monohydroxy alcohol of unknown origin and significance, but it is considered to be a probable precursor of the carotinoid pigments and is a component of vitamin K.

The methyl group marked with an asterisk is replaced by an aldehyde group in chlorophyll b.

Alkaline hydrolysis of chlorophyll yields a series of phyllins—magnesium-porphyrin compounds—and treatment of the phyllins with acid removes the magnesium, leaving porphyrins, which resemble, although not identical with, the protoporphyrin found in hæmoglobin and hæm pigments. The transport of the pyrrole nucleus from plants to animals may be considered here. The porphyrin nucleus begins its history in the plant, where the pyrrole ring is synthesised, and appears in the amino acids tryptophane, proline and hydroxyproline, as well as in the hæm pigments and in chlorophyll. The ability of the higher animal to synthesise the pyrrole ring has not been established, and it is known that one at least of the pyrrolecontaining amino-acids, tryptophane, is essential in animal nutrition. Consequently, it may be that the animal is dependent untimately on the plant for its porphyrin units. It has been shown that bilipurpurin,

or cholehæmatin, a pigment present in the bile and biliary concretions of ruminants, is identical with phylloerythrin, a porphyrin pigment which was obtained by the biological degradation of chlorophyll or the acid hydrolysis of chlorophyllides. The discovery of phylloerythrin thus leads to the conclusion that the chlorophyll molecule may enter into the metabolic processes of herbivorous animals.

Extraction Process.—An alcoholic extract from green leaves contains at least four different colouring matters, namely: (1) Chlorophyll a, blue-green; (2) chlorophyll b, yellow-green; (3) carotin, orange; (4) xanthophyll, yellow; the proportions of these varying according to the nature of the plant material which is used in making the extract. In the production of chlorophyll, the vellow constituents have to be more or less completely separated, depending upon the nature or grade of the chlorophyll desired. This is work which calls for considerable technical skill and experience, and the use of expensive plant. Chlorophyll is generally produced from carefully dried nettles or grass, and the initial extraction is usually made with alcohol or acetone. The chlorophyll content of dried nettle leaves is about 0.8 per cent. and by some methods about 80 per cent. of this can be extracted. The subsequent purification may be accomplished in several ways; for instance, the yellow bodies may be separated by absorption on talc, by precipitation methods, or extraction with light petroleum. Commercial grades of chlorophyll, as distinct from medicinal chlorophyll, are extracted in the presence of copper, which replaces the magnesium in the molecule. This has the effect of rendering the substance more stable and, at the same time, gives a stronger blue tint. Oil-soluble chlorophyll, which is used for colouring fats, oils, soaps, etc., is produced by treating the substance with benzol and then diluting the purified extract with a suitable fat, such as coconut stearine. Alcohol-soluble chlorophyll is prepared by diluting the extracted chlorophyll with castor oil to the required colouring strength, and water-soluble chlorophyll is made by treating chlorophyll extract

Uses of Chlorophyll.—One of the main industrial applications of chlorophyll is its use as a colouring material in the manufacture of soap. In this field certain grades of chlorophyll have the advantages

of being oil-soluble and being capable of imparting to the soap a natural green or greenish-yellow colour, which hardly changes during manufacture of the soap. Relatively small quantities of chlorophyll are sufficient for this purpose. Similarly, chlorophyll is used in colouring oils, fats, perfumes and cosmetic preparations. Apart from the technical uses of chlorophyll as a substance for imparting or hiding colour, it has become increasingly used in recent years for medicinal purposes. Both chlorophyll and the derivative phæophytin exhibit marked therapeutic properties. Much work on the physiological properties of chlorophyll by animal experimentation has been done on the Continent and it has led to the conclusion that the substance is capable of producing a dilatory effect on the blood vessels, and of maintaining the force of the heart beat, has a stimulating effect on the hæmopoietic organs, and brings about an increase in the red blood cell and hæmoglobin contents of the blood and also on the basal metabolic rate. Among the conditions for which chlorophyll has been employed therapeutically are high blood pressure, metabolic disorders and certain anæmias, and the literature on the subject appears to provide evidence that its use in these conditions may be attended by a considerable amount of success. Phæophytin is obtained from chlorophyll by the action of acids in substituting hydrogen for magnesium in the chlorophyll molecule. During recent years zinc and copper phæophytins, which are obtained by the substitution of the metals for the hydrogen of phæophytin, have been used. These substances are said to be more stable than natural chlorophyll. The copper compound is unaffected by acids or alkalis and retains its colour well, both in the light and in storage over a period of years. Copper salts of chlorophyllin, which is formed by saponification of chlorophyll, have also been used, and claims have been made that they also are superior to the natural chlorophyll. However, the latter is by far the most extensively used.

PHARMACY IN THE R.A.F.

THE requirements in dispensers for the Royal Air Force are normally met by training within the Service. In war-time, although training with the Service continues, any additional urgent requirements are being met by special direct entry of pharmacists or those in possession of the certificate of the Apothecaries Hall. Qualification as a dispenser in the Service carries additional marks for promotion in general, and is compulsory in peace-time for promotion to the rank of warrant officer in the medical branch. Established posts for dispensers in the Royal Air Force are only found in hospitals and large sick-quarters. In the smaller station sick-quarters the medical officer is responsible for these duties.

Daily Routine.—The day's work in a Service dispensary begins at 8 a.m., and entails sweeping, polishing, dusting and changing linen. Stock bottles from the wards and departments begin to arrive at about 8.30 a.m., and all should normally be in the dispensary by 9 a.m. The work is divided into sections—one man compounds lotions, gargles, paints, tablets and pills, whilst another attends to mixtures, ointments and potent drugs. Dressings are not attended to until the issue to wards and departments is about to be made, as their bulk occupies much valuable working space in the dispensary. The demand for the day's dispensing, entered in a book provided for that purpose, is forwarded to the dispensary by 10.30 a.m., signed by the medical officer in charge of the ward or department concerned. Prescriptions for Dangerous Drugs and those marked "urgent" are, of course, dealt with immediately. The morning's dispensing is usually completed at about 11.45 a.m., and is then checked, marked with the quantities issued, and initialed by the checker. From 12 noon to 12.30 p.m., the dispensing is collected by orderlies from wards and departments, and the dispensary closes until 2 p.m.

Special Prescriptions.—In the afternoon, "out patients" and special prescriptions are dealt with as they arrive; stock preparations are made up and bulk dressings and drugs drawn from the main medical store. Dangerous drug prescriptions are entered in the Dangerous Drug ledger, accounted for on the stock sheets, and then filed. All prescriptions are then copied in a prescription-book and numbered for future reference. At 4.30 p.m. the dispensary closes for the day, but each day a duty dispenser is detailed, who remains within call until 8 a.m. on the following day, and during the lunch period of the day of duty, to deal with any urgent work that may arise, thus ensuring a twenty-four hour attendance in the dispensary. The duty dispenser is in addition responsible for the supply of articles required from the medical store, as opposed to the dispensary, outside normal working hours.

A healthy spirit of competition exists among Service dispensers, each trying to produce a more pharmaceutically elegant preparation than his colleagues and all of them endeavouring to keep abreast of the latest advances in the pharmaceutical world.

THE ROSE CASE

By Howard Bayles

THE long-drawn conflict between physicians and apothecaries in the seventeenth and eighteenth centuries has been depicted by various writers, but always, it may be suggested, with a deficiency in perspective, a deficiency chiefly observable in two aspects. In the first place, the scale on which active hostilities were conducted was smaller than the voluminous output of contemporary polemic may suggest to a casual student. In the second place, it seems to have been generally concluded, or assumed, that the centre of importance in the narrative is the publication, in 1699, of Garth's poem, "The Dispensary." Even so valuable and well-documented a book as C. R. B. Barrett's "The History of the Society of Apothecaries of London" (1905) has this statement (on p. 117): "But the Dispensary dispute ... was now [1699-1700] at an end. It was killed by the efforts of Dr., afterwards Sir Samuel, Garth." The fact that a tenth edition of "The Dispensary" appeared so late as 1741

should suffice to render this deduction questionable; indicated in the concluding paragraph of this narrative, a recrudescence of enmity between the two classes became manifest from time to time during the eighteenth century. A minor consideration hitherto ignored is the prestige enjoyed by the Society of Apothecaries as a City company, a factor not without influence. A marshalling of the evidence should make it clear that the decisive event in the campaign was the judgment of the House of Lords in 1703-04 in the case of William Rose versus The Royal College of Physicians.

As is well known, the Society of Apothecaries of London obtained its charter of incorporation in 1617. Some practising apothecaries remained outside the Society. Contemporary estimates of the increase in the number of apothecaries' shops in London between 1617 and the turn of the century vary, and must be read with caution. A pamphlet published in 1698 under the title "The State of Physick in London' states that about sixty years earlier the apothecaries of London and Westminster did not number 100, but that they had increased during that period to more than 800. In the same year Salmon, in "A Rebuke to the Authors of a Blew-Book . . . ", gave the nu

Blew-Book . . . ", gave the number as "but a little above" 400. "Bellum Medicinale" (1701) put the total at 1,000, and "The Present ill State of the Practice of Physick . . ." (1702) at "nearly" the same number. The regular issue of directories in London did not begin till 1736, and for several years they were manifestly incomplete: we learn, however, from the City poll books that the number of liverymen of the Society of Apothecaries who voted in the parliamentary election of 1700-01 was 143, and that in 1710 the corresponding number was eighty-three. The number of qualified physicians was smaller. The lists of Fellows, honorary members and licentiates of the Royal College of Physicians published near the beginning of the eighteenth century contain, on an average, about 120 names. A contemporary broadside compiled by John Badger, "M.D.", states that on October 4, 1695, the number of members of the "new Association of Physicians in Warwick-Lane, who vulgarly call themselves the College" was 130, "most of whom are no doctors." According to his account, the people entitled to call themselves doctors of medicine numbered 386. A "catalogue" of the College for the same year contains the names of sixty-eight Fellows, ten honorary Fellows and forty licentiates: a similar publication for

1747 gives fifty-two Fellows and twenty-four licentiates. The charter of the Society of Apothecaries, a document of about nine thousand words in its English translation, provided for the control of London apothecaries by the Society, and for consultation with the president and certain other members of the Royal College of Physicians "for so many and such Ordinances which concern Medicines and Compositions, and the use of the same." Barrett's History makes it clear that by 1632, if not earlier, friction between the two bodies had arisen. So long as the only record of hostilities was to be found in the respective minute-books, it may have been possible to withhold all knowledge of the matter from the public; but soon after the Restoration some of the controversialists began to enlist the aid of the printing press. The main issue, finally decided by the Rose case, was whether apothecaries were entitled to prescribe for patients as well as to dispense physicians' prescriptions and to sell medicaments.

The Royal College of Physicians in the eighteenth century. (From the frontispiece of the Pharmacopæia Londinensis, 1746.)

Dispensing.—The earliest pamphlet traced for the purposes of this account bears the date 1665 and the initials T. M. Entitled "A Letter Concerning the Present State of Physick, And the Regula-tion of the Practice of it in this Kingdom," it is neutral in tone while offering a solution of the controversy favourable to the physicians' claims. It suggests that they should dispense their own medicines, buying the ingredients from such apothecaries as refrain from medical practice; or alternatively that apothecaries should dispense medicines prescribed by physicians but the physicians should send these medicines to their patients and keep the records. further suggests that the College should set up a laboratory for preparing chemical medicines, and that apothecaries should obtain all supplies of such medicines there unless otherwise permitted by physicians. The solution was not sufficiently pro-physician for "Dr. C.T.," who in 1670 "Dr. C.T.," who in 1670 replied with "Some Papers Writ in the Year 1664 . . .", advancing further suggestions of the same kind. pamphlets gave the public a general idea of the physicians' side of the case; in 1666 two books, extending to 225 pages and 189 pages respectively,

took up similar positions with regard to each other. One, "Vindiciæ Medicinæ & Medicorum . . .", was written by N. Hodges, M.D.; the other, "Loimotomia: or the Pest Anatomized . . .", by George Thomson, M.D. In Tract VI of his "Medicus Absolutus" (1668), Everard Maynwaring, M.D., introduced an imaginary conversation between an apothecary and himself, resulting in an exposition of the physicians' claims. With the arrival of Christopher Merrett, M.D., F.R.S., in the ranks of medical authors, polemic assumed a sharper tone. In 1669 he laid about him vigorously in "A Short View of the Frauds, and Abuses Committed by Apothecaries; . . and Of the only Remedy thereof by Physicians making their own Medicines." On the seventh page he made this uncompromising declaration: "But before I descend to particulars, I shall first lay down this Proposition, . . . That they may be the veriest Knaves in England." On the next page we read:

"First. They use Medicines quite contrary to the prescription, . . . Sheeps Lungs for Fox Lungs, the Bone of an Oxe Heart for that of a Stags Heart, Damsons for Damasc Prunes. . . . "Secondly, They falsify the grand Compositions of the London

Dispensatory. . . .

"Thirdly, 'Tis very common for them to load Medicines with Honey, and other cheaper ingredients. . . .

"Their increasing disrespect, and undervaluing the Colledg, appears in this, that of late years they place our Censors invited to their new Masters Dinner, at their second Table; whereas always heretofore they were seated at the first Table, next to the Master of the Company."

According to this author, the apothecaries' professional conduct had deteriorated as badly as their manners: they

"made people believe they had acquired some skill in the Art, and

upon them the whole Practice of Physick. . .

Merrett's book was answered in the following year by "Lex Talionis; sive Vindiciæ Pharmacoporum: or a Short Reply to Dr. Merrett's Book; And Others, written against the Apothecaries: Wherein may be Wherein may be discovered The Frauds and Abuses committed by Doctors Professing and Practising Pharmacy." The sentence last quoted from Merrett's book was thus countered by the anonymous author:

"... and in the Plague time, [apothecaries] took upon them the whole Practice of Physick; (as the quarrelsome *Doctor* affirms) or else it's well known the Kings Subjects (then much distressed) had been in a worse and more deplorable condition. . . . "

The fact was that a considerable number of the London physicians followed the Court to Oxford during the plague of 1665: this circumstance may have strengthened the position of the London apothecaries. Merrett responded to the challenge of "Lex Talionis" with the thirty-page pamphlet, "Self-Conviction; or an Enumeration of the Absurdities, Railings, against the College, and Physicians in general. . . . " In 1676 he devoted five pages to the same subject in his anonymous book, "The Accomplisht Physician, the honest Apothecary, and the skilful Chyrurgeon, detecting Their necessary Connexion, and dependance on each other. This treatise, however, has a wider scope. Some of Merrett's observations are still applicable:

"And in this particular [readiness to be imposed upon] our Women are so violently eager, that if the vulgar Physician can but make a true sound upon the Treble of their Fancy, he will produce such a harmony, as shall sound his praise through City and Countrey;

and without these Female Instruments or She Trumpets, it's almost impossible for a Vulgarist to arrive to a famous report, who having once by his Tongue harmony inchanted the women, doth by the same cheat subject. the Opinions of men to his advantage, women generally usurping and impropriating the affair of their Husbands health to their own

"Others are no less skilled, in counterfeiting their great practice, by causing their Apothecary, or others, to call 'em out of the Church at an Afternoon Sermon, to hasten post to a suborn'd Patient. . . ."

Commercial Instincts.—This feat of leaving church services hastily with the presumptive intention of visiting patients is attributed to at least one medical practitioner whose name appears in the Dictionary of National Biography; and it may have given Dickens a hint for his Bob Sawyer in "Pickwick." Merrett's mention 'going snips" among physicians and apothecaries, and of prescriptions written in code, indicates a highly developed commercial sense among both classes. He admits that apothecaries have their use in prescribing cheaply for household servants, an admission that weakens his case against their alleged encroachment on the physicians' province. His advocacy of continental visits for medical students suggests a more enlightened man than his controversial passages reveal.

Jonathan Goddard, M.D., F.R.S., followed on the same side in 1670, with more moderation, in "A Discourse Setting forth the Unhappy Condition of the Practice of Physick in London. Goddard obtained his degree at Cambridge in 1643, and later became professor of physic at Gresham College, London. His book suggests that neither side was free from responsibility for the breach:

"... many Physicians, while there was a good understanding between them and the Apothecaries (these keeping within their own bounds) thinking it became them, in civil respect, to leave all to these, that belonged to their Art, and so not concerning themselves to be judicious and versed therein, became strangers to the Materials and Preparations of Medicines; and by consequence, less able to prescribe the making of them, to the best advantage. And this the Apothecaries have not been wanting to make their Advantage of, to the disparagement of the Physicians..."

His remedy was that physicians should prepare certain medicines

themselves, leaving others "of less value and consequence" to the attention of the apothecaries. How-ever, "it is far from the intention hereof to brand all apothecaries, many of whom are allowed to be honest and conscientious, as well as eminently able and skilful in their profession. . . .

Free Advice to the Poor.— Evidence by the two responsible bodies chiefly concerned in the conflict, the Royal College of Physicians and the Society of Apothecaries of London, may now be examined. The College placed on record in 1679, with its imprimatur, "A Short with its imprimatur, "A Short Account of the Proceedings of the College of Physicians, London. In relation to the Sick Poor Of the said City, and Suburbs thereof, With the Reasons which have induced the College to make Medicines for them at the Intrinsick Value." Society submitted one part of its case to the Admiralty, by means of a memorandum, in 1702. The "Short Account" indicates as the first active step taken a unanimous vote of the College on July 28, 1687, to give advice free of charge to "all their Sick neighbouring Poor, when desired, within the City of London, or seven miles round." On August 13, 1688, it was resolved, again with unanimity, "That the Laboratory of the College be forthwith fitted up for preparing Medicines for the Poor, and preparing Medicines for the Poor, and also the Room adjoining for a Repository." On March 18, 1694, an order was passed requiring "strict Obedience from all our Members" to "the aforesaid Order." The new order was "presented" to the City Council on June 18, 1695: the Council appointed a committee for Council appointed a committee for the purpose of thanking the College

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and of consulting with it "how to improve the advantage proposed." A consultation of some kind was held about five weeks later (July 24); and the record states that several "honest and charitable Apothecaries" had been found willing to supply medicines at prices fixed by a committee of the College. The statement indicates that the apothecaries were not all of one mind in their opposition to the demands of the physicians: as the history unfolds itself, disunion among the physicians of the College becomes equally clear. The next fact of importance found in the "Short Account" is that the Society of Apothecaries presented a "Paper" to the committee of the City Council tending to frustrate the plans of the College, and "frightened" most of the "honest and charitable" apothecaries. The status of the Society as a livery company of the City must not be overlooked in this connexion. The College or its committee prepared a report for submission to the City Council; but it was never presented, as a new Council was elected at that juncture: that, at any rate, is the reason given for withholding the report. However, on December 22, 1696, the College opened a subscription list for such of its members as were willing to contribute £10 each for setting up dispensaries. Eventually three were opened. (To be continued)



Entrance to the Apothecaries' Hall, Water Lane, London, E.C.4

EARLY EXPERIMENTS IN EMULSIONS

THE emulsifying property of such substances as yolk of egg and gum acacia must have been known to mankind, however imperfectly, for several centuries past. It is of interest to trace the gradual application of this property for the purposes of medicine and pharmacy in this country, long before emulsifying machinery had been devised. The earliest use of "emulsion" (with a different spelling) quoted in the Oxford English Dictionary occurs in the anonymous "Enchiridion Medicum" of 1612, which on p. 138 of Part II has this phrase: "Also an emulction prepared of Almonds. A formula and directions are given. In a discourse read before the Royal Society on December 10, 1674, "concerning the Nature, Causes, and Power of Mixture," Nehemiah Grew, M.D., mentioned certain experiments in incorporating essential oils, resins and gums in vinous or aqueous media. Grew is well known, through occasional references in The CHEMIST AND DRUGGIST and in Wootton's "Chronicles of Pharmacy," as the patentee of a salt obtained from Epsom waters. He was a man of considerable distinction, a Fellow and secretary of the Royal Society, which in his day included such brilliant pioneers in research as Boyle, Mayow and Willis; and his contributions to the proceedings of the Society were substantial. In the appendix to the discourse referred to he wrote:-

". . . the preparation of Essential Oyls, so as to become easily mingleable with any unoyly Liquor . . . may be done by digesting any of the said Oyls with about an equal quantity of the Yelk of an Egg, with a very soft heat, like that of the Meridian Sun in Summer, continued for the space of three Weeks or a Month; and in the mean time, to be now and then stirred a little together. ... I confess that it will be very difficult to prepare any good quantity for use, this way. But . . . [I] have made several successful tryals; not only for the mixing of the said Oyls, but likewise of all sorts of Rosins and Gums with any winy or watery Liquor, in great quantities, in a short time, and without much trouble.

Grew was more interested, however, as this discourse shows, in chemical combination than in practical pharmacy. He approached the subject of "Mixture"

from another angle in the following year in "The Anatomy of Trunks, which reached a second edition in 1682. In Chapter IV of the second part, headed "Of the Generation of Liquors," he distin-guished between a "Rosin," an "Oylie Gum," and an "Unoylie Gum." Among the first class he instanced and benzoin: mastic among the second, sagape-num and ammoniacum; and among the third, gum acacia and "the gum of the cherry tree." His observations included the remark: "This [third kind of Gum, though commonly so called, yet is properly but a dryed Mucilage."

Barton's Researches.-



NEHEMIAH 1712). (From an engraving in the British Museum.)

In the middle years of the eighteenth century these observations attracted the attention of a Dublin apothe-GREW, M.D. (1641 cary named Barton. The preface to Barton's anonymous pamphlet of 1747, "A

New Method for the Improvement of the Manufacture of Drugs "is dated July 1746; and in the final section of the pamphlet the author states that his work on the subjects dealt with had been finished nearly two years previously, and had been planned as a help to the compilers of the Pharmacopæia Londinensis of 1746. Following the line of thought indicated by Grew, Barton made five experiments;

(1) He evaporated the mucilage obtained by aqueous infusion from any vegetable to "a gummy Hardness." Having softened this product with oleum tartari per deliquium, he added "a Portion of any essential Oil or Balsam," laid the mixture by to harden, and finally triturated it with water into an emulsion "or lactescent

Liquor." (2) He repeated the experiment with the substitution of honey for the oleum tartari per deliquium. (3) He triturated the same mucilage with a pine-tree balsam and water. (4) He repeated the third experiment with the substitution of an acacia mucilage for his original mucilage. (5) He made an emulsion with an acacia mucilage, almond oil and water.

Barton expressed the view that some such process went on in mucilaginous seeds, and added: "For it has not, I believe, been

suspected, that this Union of Oils, both essential and expressed, with Water, could be accomplished in this Manner."
Quincy's "Pharmacopæia Officinalis & Extemporanea" (1718) contains twenty-four emulsions. The 1730 edition of Fuller's "Pharmacopæia Extemporanea" contains fifteen, several made with almonds one with gum acacia, one with gum acacia and almonds, and one with yolk of egg. (Incidentally, Fuller accused Quincy of "pirating" some of his formulas for these galenicals.) Allen, in "Synopsis Medicinæ" (1730), quotes three of Fuller's emulsion formulas and one attributed to Bate, whose "Pharmacopœia Bateana" first appeared in 1688. It was probably the case, however, that these formulas and others of a similar type had been devised without much regard to method of preparation or to stability. The section "Mixturæ" in the 1746 P.L., comprising six preparations, includes an Emulsio Communis, in which sweet



Dr. J. Fothergill. (Frontispiece from "A Complete Collection of the works of Dr. Fothergill.")

almonds are triturated with sugar and gum acacia in barley water is added, and a Julepum e Creta, in which gum acacia is used with the simple direction "Misce." These experiments came to the notice of John Fothergill, M.D., F.R.S.; realising their bearing on current methods of administering certain medicaments, he requested James Bogle French, an apothecary in Wood Street, London, to make further trials and to report on them. French's results were afterwards published, with a covering letter dated January 18, 1757, by Fothergill. In his report he recorded thirtyseven experiments or groups of experiments, eleven with simple agitation and most of the remainder with "attrition." The emulsifying agents tried, singly or in combination, were: (a) An acacia mucilage consisting of 4 oz. of "clean gum Arabic" in 8 oz. of New River water; (b) powdered gum acacia; (c) syrups of various kinds; (d) honey; (e) yolk of egg; (f) a tragacanth mucilage of "similar consistence" to the acacia mucilage; (g) quince mucilage; (h) starch jelly. A few substances such as myrrh were occasionally triturated, for comparison, with water only. The mortars were of glass or marble.

Wide Range of Substances.—French varied his proportions of mucilage, oil (or balsam) and water methodically. In one of his first eleven trials, for instance, the ingredients were: Syr. simp. 3j., In one of his. mucil. acac. 3j., ol. olivæ 3ss., sp. vini ten. 3jj., aq. 3j. He next. repeated this trial without the syrup. Among the substances emulsified with varying degrees of success were almond, linseed and olive oils, balsams of copaiba, Gilead, Peru, sulphur and tolu, beeswax, benzoin, camphor, cetaceum, myrrh, musk, the essential oils of anise, clove and nutmeg. His final experiment was an attempt to "cover the acid of vitriol" with mucilages. He found acacia mucilage best for the purpose, but did not state—and perhaps did not know -the strength of the acid. He noted in general terms, though not minutely, the degree of stability attained in each case. It may fairly be claimed that his research put emulsions "on the map." This be claimed that his research put emulsions "on the map. investigation ultimately formed a section of twenty-four pages in "A Complete Collection of the Medical and Philosophical Works" of Fothergill, published in 1781. A prefatory life of Fothergill, by John Elliot, M.D., makes it clear that he was a man of charitable and generous character. The representation of the work of the Good Samaritan shown under his portrait in that volume has thus an appropriateness independent of the *de mortuis* compliment.

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RECENT DEVELOPMENTS IN THERAPEUTICS

by F. Prescott, M.Sc., Ph.D., A.I.C., M.R.C.S., L.R.C.P.

IV.—Hormones

Pituitary Hormones.—As yet, with the possible exception of prolactin, no anterior pituitary hormone has been obtained in pure form. Prolactin, which has been used to increase milk secretion in nursing mothers, has been obtained from the gland by fractional precipitation at various pH levels. Attempts to prepare the gonadotrophic hormones, prolans A and B, which stimulate the sex glands, have failed. Prolan A stimulates the ripening of the Graafian follicles of the ovary and produces ovulation; prolan B converts the unripe follicle into the corpus luteum. Another gonadotrophic hormone stimulates the cells of the ovary to form æstrogens and the cells of the testis to secrete androgens. The anterior pituitary has also been shown to contain thyrotropic and corticotrophic hormones, which stimulate the thyroid gland and adrenal cortex respectively. There is evidence that the anterior pituitary secretes a growth-promoting principle and also plays some part in the control of carbohydrate metabolism. Two principles have been isolated from the posterior lobe of the pituitary—oxytocin, which stimulates the uterus, and may play some part in the onset of labour, and vasopressin, which produces a rise of blood pressure.

Adrenal Cortex Hormone.—The medullary portion of the adrenal gland secretes adrenaline. From the cortical portion over twenty crystalline derivatives have been prepared, the most active of which is desoxycorticosterone. The acetate of this is known as D.O.C.A. In 1936 Reichstein prepared active crystalline fractions from cortical extracts and a year later he established the structural formula of the most active of these—corticosterone. synthesised an even more active compound, desoxycorticosterone, which was subsequently found in adrenal tissue. D.O.C.A. is specific in the treatment of Addison's disease, the best method of administration being by subcutaneous implantation. High salt diets and additional sodium chloride are also of help in treatment. The administration of D.O.C.A. has also been recommended for the treatment of toxæmia and collapse during the course of infectious diseases, severe burns accompanied by shock and toxemia, surgical and wound shock, muscular exhaustion, and over-exposure to x-rays and ultra-violet light.

Pancreas and Spleen Hormones.—Endeavours to produce an insulin that can be taken by mouth have proved unavailing, but the introduction of zinc protamine insulin, which is only slowly absorbed, has made it possible to reduce injections to one a day. Protamine, obtained from the gonads of the male trout, and zinc render the insulin relatively insoluble. An alcoholic extract of pancreas contains another hormone known as lipocaic, which is thought to be concerned with fat metabolism. Care must be exercised in its use as it also causes a fall in blood pressure. Evidence is accumulating that the spleen is an organ of internal secretion. In the experimental animal, at any rate, the injection of spleen extracts can modify chloride metabolism and can control formation of red blood cells in the body.

Sex Hormones.—The sex hormones are relatively simple derivatives of a saturated tetracyclic hydrocarbon, cyclopentenophenanthrene, which is also the parent

112 17 16 11 13 17 16 15 15 15 phenanthrene, which is also the parent substance of the sterols, bile acids and toad poisons. The sex hormones furnish an excellent example of the differences in biological activity that may result from relatively slight alterations in chemical structure. The chemical nomenclature is relatively simple. Androgens, the male sex hormones, which have the root—androst—are derived from androstane which is 10:13-dimethyl cyclopenteno-

phenanthrene; estrogens, the female sex hormones, have their root—*estr*—, are derived from *estrane*, the 13-methyl compound; and the progesterone group with the root—*pregn*—are derivatives of *pregnane*, which is 10:13-dimethyl 17-propyl-cyclopentenophenanthrene.

Androgens.—In 1931 Butenandt isolated from male urine a pure crystalline hormone which he named androsterone, and which has since been obtained synthetically by the degradation of cholesterol. Androsterone is a reduction product of testosterone, the true hormone of the testis, which is six or seven times more active biologically. Testosterone, originally obtained from testicular tissue, has now been prepared artificially from cholesterol, and recent research has shown that esterification increases the activity, the propionate being the most active ester. Although these two hormones are the principal ones in clinical use, a number of other androgens have now been prepared in the laboratory. These include

methyl testosterone, transdehydro-androsterone, androsterediol. androstanedione, and androstendione. The ending -ane denotes a saturated compound, -ene an unsaturated compound, -ol a hydroxy derivative, and -one a ketone. The activity of the androgens is determined by observing their action in regenerating the seminal vesicles of castrated rats or the atrophied comb and wattles of a castrated cock. One international unit is equivalent to the activity of o i mg. of standard crystalline androsterone. In the case of testosterone dosage can be based on the weight of pure substance. Normally androgens are administered intramuscularly in oil, but recently it has been found that they can be absorbed percutaneously if dissolved in an ointment base. Another method of use has also been tried, namely the subcutaneous implantation of a tablet of compressed crystals. The body can then be exposed to the action of the hormone over a period of several months. In the majority of cases the dose by injection is in the region of 100 mgm. The indications for androgen therapy in the male are: (1) Restoration of sexual function and psyche in cases of accidental and surgical castration; (2) hypogonadism in cases of delayed puberty and undescended testicles, although the gonadotrophic probably of more value; (3) treatment of sexual underdevelopment in adults, premature senility, the "male menopause," and some cases of sterility; (4) treatment of prostatic hypertrophy if operation is inadvisable or refused, and of neuroses and psychoses of sexual origin; (5) mental disorders. Androgen therapy has also been used in gynæcological conditions such as mastitis, painful lumpy breasts, dysmenorrhœa, uterine hæmorrhage, and the treatment of afterpains following childbirth.

Female Sex Hormones.—These consist of the estrogens and the progesterone group. The estrogenic or follicular hormones are derivatives of œstrane, and are responsible for the development of the secondary sex characteristics of the female, the growth of breast tissue, the development of the uterus and the control of The naturally-occurring estrogens are estradiol, the "true" follicular hormone, present in the Graafian follicules of the ovary and in the urine of pregnant women; cestrone and cestriol, which occur in urine and placental tissue respectively. The most potent is æstradiol, especially in the form of its benzoic and propionic esters, and the derivative ethinyl estradiol, which has recently been prepared. Estrone being water-soluble can be given by mouth, in the form of suppositories, and by injection. Œstradiol is not water-soluble and must therefore be injected. It is more suitable than æstrone if a prolonged action is required. It has been shown that the œstrogens can be absorbed through the skin and mucous membranes, and ointments containing them have recently appeared on the market. As in the case of the androgens the estrogens have been administered by the subcutaneous implantation of compressed crystals. In this way accurately controlled use of the hormones over long periods is obtained. The implanted tablet is removed after a definite period and the loss in weight of the tablet corresponds to the amount of substance absorbed. Other naturally occurring æstrogens or their derivatives are equilenine, equiline (both from pregnant mare's urine), œstrane-3-ol, œstrane-3: 17-diol, and œstratriene-3-ol. During the last two years a number of synthetic substances, not chemically related to the naturally occurring æstrogens, have been prepared and found to possess a powerful estrogenic action. These include stilbestrol (diethylstilbestrol or the stringesting action. These include stringesting the stringesting of 4:4-dihydroxy- $\delta:$ diphenyl-n-hexane), and triphenylchlorethylene, all of which have been used clinically. They possess the advantage of being fully active by mouth and can be prepared at a fraction of the cost of the natural œstrogens, but they appear to have unpleasant side reactions (nausea, rashes, vomiting, flushing) in some patients. The natural estrogens suffer a reduction of activity of four-fifths when given by mouth. Clinically the estrogens are used in the treatment of menopausal symptoms, amenorrhoea, and to induce labour. Recently an attempt has been made with them to treat diabetes in women.

The progesterone group includes progesterone (pregnenedione), the corpus luteum hormone, and pregnanediol, an inactive excretion product of progesterone found in the urine of pregnant women. Progesterone is now obtained artificially from stigmasterol, a plant sterol found in the soya bean. The progesterone group may be regarded as being essential for the embedding of the fertilised ovum in the uterus and for the maintenance of early pregnancy. Progesterone is inactive by mouth, but a related substance, pregneninolon (anhydrohydroxy-progesterone), which is active orally, has recently been synthesised. Progesterone (or pregneninolon) is used in the treatment of menorrhagia, dysmenorrhæa, some cases of sterility, etc.

SEX HORMONES

History of Hormone Therapy.—The study of hormones dates back to the work of Brown-Sequard, who, after an injection of crushed testicles on himself, noticed a stimulation of his intellectual and genital functions. Although only empirical, this observation opened the field to new work on the subject. Today the terms organotherapy and endocrinology are in common use. The first refers to the therapeutic use of extracts obtained from the gland, and the second to the study of their secretions—the hormones themselves either extracted from the organs or from the products of elimination, or elaborated by synthesis. In modern therapeutics, hormones corresponding to definite chemical formulæ, of constant activity, prolonged stability and easy administration, are rapidly replacing gland extracts. Their introduction has resulted in simplified standardisation of the different substances. Thus mice or rat units have been chosen for œstrogens, rabbit units for progesterone, capon units for male hormone, guinea-pig units for pituitary and thyroid, rabbit units for insulin, and dog units for suprarenal cortex. Such methods may induce widely different interpretations for even if animals of similar weight are chosen, their race and origin are different and consequently they exhibit different reactions. When the first of the hormones (follicular), was produced, a controversy arose, lasting many years, as to the precise value of the mouse and rat units and the relation between them. Following the recommendations made by international conferences on the standardisation of hormones, weight units in milligrams or fractions of milligrams were agreed upon for æstrone, æstradiol benzoate, progesterone, pregneninolone, testosterone, desoxy-corticosterone and gonadotrophin. These international units refer to products which conform to definite standards and have replaced, where hormones are concerned, biological

Physiology of Hormones.—Endocrine therapy of substitution became established after the results obtained with thyroid extract in the treatment of myxædema had been observed. Aschner and Iscovesco induced a congestion of the uterus in immature guinea-pigs by injection of ovarian extract free from corpus luteum. Later, in 1927, Ascheim and Zondek demonstrated the presence of large quantities of follicular hormone in the urine of pregnant women. In 1931, Zondek showed that the urine of pregnant mares was forty times richer in follicular hormone than the urine of pregnant women; this allowed manufacturers to include follicular hormone in the list of therapeutic products for general practice. It was Girard, working in recent years in France, who devised the first industrial production of follicular hormone, which plays an all-important rôle in the physiology of woman. First, the hormone induces development of the uterus and the menstrual cycles. In the first period of a catamenial or menstrual cycle, a follicle ripens, with constant secretion of increasing quantities of follicular hormone. The follicle bursts after a ripening period of about fifteen days, with liberation of an ovum. At this time, in place of the burst follicle, a new transitory endocrine gland—the corpus luteum -appears, secretion of which induces a considerable transformation in the structure of the uterine mucosa already modified by the action of follicular hormone. The corpus luteum secretion prepares the uterine mucosa for the implantation of a fertilised ovum. If there is no fertilisation, the modified portion of the uterine mucosa falls with a hæmorrhage, this constituting the menstrual flow, which occurs about the twenty-eighth day after commencement

The hormones will now be considered separately.

Progesterone.—Although the existence of progesterone was suggested by Prenant at the beginning of this century, only in 1928 was it demonstrated by Weichert and confirmed by Winter and Gley. Its manufacture and administration simultaneously with follicular hormone, enabled Kauffmann to induce complete menstrual cycles in castrated women. Progesterone plays an important part in fixation of the fertilised ovum, and has the property of lowering the tonicity of the uterine muscle. Softening of the uterus at the beginning of pregnancy is due to its action. Progesterone is a specific female hormone, for in contrast to follicular hormone no trace of it can be found in the male. Nor is any progesterone to be found in the urine of pregnant women, for it is split up in the kidneys and eliminated in the form of pregnandiol. Whereas follicular hormone is specifically the hormone of ovulation, progesterone plays an all-important part in fixation of the fertilised ovum. For this reason, it has been called sometimes the hormone of pregnancy. Further, while follicular hormone is active whether given orally or by injection, progesterone is active only by injection.

Pregneninolone.—In 1938, workers discovered a progesterone derivative which is active by mouth; this was called pregneninolone. Is is about five times less active than progesterone and has been

described and used under different names such as anhydro-oxy-progesterone, ethinyl-progesterone, ethinyl-testosterone, etc. The chemical composition of pregneninolone is closely allied to that of progesterone. Experimentally, all the pregravidic transformations of the uterus can, by its administration, be induced in an immature or ovariectomised rabbit previously sensitised with follicular hormone. The discovery is important, as it gives to clinicians an easily administered product for progesterone therapy, and renders it sufficient to administer a few tablets at the appropriate time.

Testosterone.—In 1931, Butenandt isolated from the urine of males a crystallised hormone which he called androsterone, but the necessity of treating several tons of urine to obtain a few milligrams of hormone inhibited any practical use from being made of the product. Only in 1935 did Ruzicka succeed in producing synthetic male hormone from cholesterol, Girard achieving the same synthesis about the same time. The compound so obtained had all the properties of testicular extracts. It was capable of inducing rapid growth of capon's comb, with modification of feathers, and even of inducing crowing. On the rat, its effect was noticeable in developed seminal vesicles and prostate. In immature animals a rapid appearance of the secondary sexual characteristics was obtained, together with development of the external genital organs. Shortly afterwards communications by Roussel, Girard and others demonstrated that the esterification of testosterone considerably augmented its physiological activity. They showed after preparation of eleven new esters, that the formiate, acetate and propionate were the most active in the test on the seminal vesicles of the rat and on growth of the capon's comb. It was as o observed that the longer the chain of carbon atoms in the fatty acid, the more prolonged was the action of the compound; thus the proprionate is the most active of the esters named. The first use of testosterone in the rapeutics was in the treatment of urinary retention in cases of enlarged prostates. Numerous successes were obtained, and it was considered that enlargement of the prostate was only one of the symptoms of old age induced by a deficiency of the secretion of male hormone in the organism. Today the product is in common use in treatment of early senility, the product restoring to the patient the normal physical capacities and tonus of his age. In the treatment of male infantilism, its use, as demonstrated in animals, induces the rapid appearance of secondary sexual characteristics and normal development of external genital organs. It is evident that testosterone plays an important part in general metabolism and maintenance of a good general physical condition in man, though it must not be considered as a direct aphrodisiac or utilised as such. In woman, during the period of active sexual life, the use of testosterone acts favourably on certain cystic diseases of the breast. In castrated women, and during the menopause, the hormone acts favourably on metrorrhagias, which, in the majority of cases, are associated with an excessive secretion of follicular hormone.

Desoxy-corticosterone.—The important part played by the suprarenal cortex in the organism is well known. It is the only endocrine gland of which the removal is rapidly followed by death. Steiger and Reichstein, in Zurich, and Kendall and co-workers simultaneously at the Mayo Clinic, isolated corticosterone so recently as 1937. From it they prepared desoxy-corticosterone, 5 milligrams of which they proved equivalent to 10 c.c. of extract of suprarenal cortex. Clinical results confirmed hopes that the new synthetic compound had all the properties of the true hormone, and it was soon possible to use the discovery and to note the almost miraculous action of desoxy-corticosterone in treatment of shock and Addison's disease.

Hormones Obtained by Extraction.—From the industrial point of view sex hormones can be classified according to their method of

preparation:—(1) hormones obtained by extraction, (2) hormones obtained by synthesis. Amongst those obtained by extraction are the keto-hydroxy follicular hormone (œstrone) and the di-hydroxy-follicular hormone (œstradiol). Among the synthetic hormones are testosterone and its esters (acetate and propionate), progesterone, desoxy-corticosterone acetate and ethinyl-testosterone. For industrial purposes, the urine of pregnant mares is used as a starting point. This is rich in œstrone and æstradiol, though its hormone content varies considerably

HO Œstrone

during the eleven months of pregnancy, being highest about the sixth month. The extraction of estrone and estradiol is based on their chemical constitution. Estrone is a compound with ketone and phenol functions having the constitution shown above.

Estradiol

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Desoxy-corticosterone

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Cestradiol is a compound with alcohol and phenol functions having the composition shown below. For practical purposes the two

hormones are present in urine in the form of water-soluble combinations, thus making possible their elimination from the body. The process of manufacture starts by hydrolysis of the urine in an acid medium in order to liberate the hormones. Extraction follows by means of a powerful solvent that is not miscible with water. After evaporation of the solvent, a residue remains that contains the gostrone and the

means of a powerful solvent that is not miscible with water. After evaporation of the solvent, a residue remains that contains the œstradiol mixed with a large proportion of other compounds. Œstrone is isolated by the use of specific reagents for ketones. Œstradiol, on the

other hand, is isolated by the utilisation of the specific reactivity of its hydroxyl functions (phenol and alcohol). By esterification the benzoate of œstradiol or œstrone is obtained, the esters being in general more active than the hormone itself. Preparation of these hormones is the result of three distinct operations—(I) Organised collection of urine; (2) controlled diagnosis, by a veterinary service, of pregnancy in the mares and hormonal contents of the urine about the 150th day of pregnancy, permitting abandonment of non-pregnant mares and mares with urine insufficiently rich in hormones; (3) treatment in the laboratories of the urine collected, necessitating a considerable amount of raw materials and special reagents.

Synthetic Hormones.—The synthesis of testosterone, progesterone, desoxy-corticosterone and ethinyl-testosterone became indis-

For practical purposes it is obtained from the spinal cord of oxen (the cord of a single ox provides about 7 gm. of pure cholesterol). It has the above formula.

The hormones have the following structures:—

It can be readily seen that these hormones are derived from cholesterol mainly by suppression of its long aliphatic side-chain and transformation of its alcohol into a ketone group. The substitution in the side-chain of the cholesterol molecule is effected by oxidation with chromic acid. An elaborate combination of compounds, in which the side-chain is substituted by shorter chains into which ketone and acid functions have been induced by oxidation is obtained. By utilising the chemical properties inherent in these chemical functions, the medium is split into two parts; acid compounds and ketone compounds.

Ethinyl-testosterone

From the ketone fraction is first extracted transdehydroandrosterone (below, left), in which the respective positions of the

Transdehydro-androsterone

Pregneninolone

ketone and alcohol functions must be inverted by delicate processes to obtain testosterone. The latter is then transformed into an ester (propionate or acetate) so that it can be presented in its most active physiological form. The work of Roussel, Girard and others, has demonstrated that the esterification of testosterone enhances its activity. Eleven esters were tried, the propionate and acetate proving the most active. From 7 gm. of cholesterol (spinal cord of one ox) 100 mgm. testosterone is obtained. From the ketone function pregneninolone (above, right) is obtained, which, by oxidation, leads to progesterone by transformation of the alcohol into a ketone group. Among the constitutive elements of the acid fraction is present the oxy-etio-cholinic acid (below, left).

Here again elaborate processes are used to transform the acid grouping ($-\text{CO}_2$ H) into a ketone-alcohol grouping (-CO CH $_2$ OH), in order to obtain oxy-pregneninolone (above, right), which, by oxidation and esterification, leads to desoxy-corticosterone acetate. Ethinyl-testosterone is derived from testosterone by the action of potassium acetylide.

ORAL COMMON COLD VACCINES

A study of the value of oral vaccines in the prophylaxis of the common cold has been made by Piccoli (see "Pharmaceutical Archives," Vol. II, No. 3). According to the report Archives," Vol. II, No. 3). According to the report, among 445 persons taking vaccine orally, 399 had 1089 (70 per cent.) less colds than usual during a year, whereas 469 controls showed a decrease of only 299 (26·3 per cent.) colds, an essential decrease of 43·7 per cent, due to the vaccine. For the fourth consecutive year experiments on 100 volunteer students, with another group of 100 students as controls not given the vaccine, confirm previous findings that the use of oral vaccines is effective in preventing colds. About 25 per cent. of those who had taken the vaccine during the winter 1938-39 reported that they had not contracted colds at all. About per cent. reported a reduction of the number of colds from the average of four per individual in previous winters to one or two, which were much milder or of shorter duration after self-immunisation. The author continues by stating that statistics from more than 3000 immunised individuals and a like number of controls showed that those not receiving the oral vaccine had approximately four times the number of colds during any experimental year as those who had taken the oral vaccine. There is no doubt that there is a real need for such methods in public health work when prophylactic immunisation has to be applied to large masses of the population. A bottle of prescribed oral vaccine can be kept in the bedroom of any individual and the weekly oral dose can be kept up all through the winter without trouble, whereas the necessity of getting a medical man to inject vaccines weekly deters many people from trying such immunisations. For the past three years, large-scale use of oral vaccine has been introduced on hundreds of thousands of workers. The forthcoming results of this massive study of the use of this oral vaccine in industry are expected to prove conclusively its true value as an immunising agent against the common cold.

TRADE NOTES

B. LAPORTE, LTD., Luton, specialise in the manufacture of such chemicals as peroxides, persulphates, carbonates and barium

Ampoules and capsules, for wholesale and export trade only, are a speciality of John Tye & Son, Ltd., 457 Caledonian Road,

THE ADVANTAGES OF UNIFLOW TRAY DRYERS are explained in the advertisement in this issue of Apex Construction, Ltd., 133 Oxford Street, London, W.I.

K.C.C. DRUMS.—E. A. Brough & Co., Ltd., Liverpool, 8, claim for their K.C.C. drum the advantages that pouring from it is easy and that it drains to the last drop.

BIOLOGICAL PRODUCTS.—Organon Laboratories, Ltd., 77 Newman Street, London, W.1, offer a wide range of standardised biological products. Full details may be obtained on application to the address given in this note.

LAROLA.—M. Beetham & Son, Cheltenham, announce that the advertising of Larola is being fully maintained both at home and abroad. Display material can be obtained and special terms for window show for home orders secured on request.

SURGICAL HOSE.—Academic Depôt, Oxford Street, London, W.I, supply surgical hose made of Lastex yarn with a two-way stretch. The hose is stated to give perfect comfort as well as correct support, while simplicity and ease in handling are attributes that will appeal to chemists in business.

United Glass Bottle Manufacturers, Ltd.—The following appointments have been made by the board:—Mr. J. M. Thrussell, sales manager; Mr. T. W. Wood, production manager; Mr. A. D. Waine, manager, buying department; Mr. R. S. Biram, controller. of supplies. Mr. Biram will retain the management of the intelligence department.

FILLING MACHINERY.—Albro Fillers & Engineering Co., Ltd., Watson's Road, Wood Green, London, N.22, are specialists in filling and bottling apparatus. Examples of the company's machinery have from time to time been described in the C. & D., but individual needs will be given special study if the requirements are sent to

VINOLIA SHAVING SOAP.—Vinolia Co., Ltd., Bebington, Cheshire, draw attention elsewhere in this issue to the special appeal their advertising has for men in H.M. Forces. It is to be noted that, though aluminium for shaving-stick containers was prohibited in the early days of the war, and it has more recently been decided that no more timplate is to be available for shaving-stick needs, the company are well placed with regard to packed stocks and empty

KODAK PRECISION ENLARGER. -- Kodak, Ltd., Wealdstone, Middlesex, have designed a new enlarger having interchangeable condensers as well as interchangeable lenses and negative carriers. This apparatus can form the nucleus for a system of photographic apparatus with wide uses in the dark room, and in taking pictures motion or still—in black-and-white or in colour. Its uses include copying, cine titling, making colour-separation negatives, photomicrography in black-and-white or colour, and as a double-extension camera. From negatives up to the maximum $3\frac{1}{4}$ in. \times $2\frac{1}{4}$ in., optimum enlargements can be made on the paper board, and enlargements of extreme size by rotating the enlarger and projecting on to a wall or floor. An illustrated folder giving full details of the enlarger may be obtained on request.

Proprietary Articles Trade Association

Alterations to Protected List,—Johnson & Johnson (Great Britain), Ltd. After July 1, 2s. size Johnson's baby powder and window-display terms on 1s. size will be withdrawn. All other terms remain unchanged.

Deletions.—Allied Laboratories, Ltd., Femilon brand tablets. J. H. Chapman & Co., M.G. tonic food beverage. Harkness, Beaumont & Co., Ltd., Sunray and Bonum malt products. (Sunray emulsion remains in protected list). protected list).

Business Changes

F. W. Hampshire & Co., Ltd., Sunnydale Works, Derby, have purchased the goodwill, manufacture and retail sale of Mrs. Pomeroy beauty preparations. A showroom will be maintained at 29 Old Bond Street, London, W.I, but orders should be sent to the works at Derby.

Monsanto Chemicals, Ltd., have centralised all branches of their organisation at their factory, Ruabon, Wrexham, Denbighshire, North Wales. Although a small staff is retained at the London office (Victoria Station House, S.W.1), all communications should be addressed to Ruabon.

BIRTHS

Notices for this column must be authenticated

COOPER.—At Pilley's Nursing Home, Sheffield, on June 10, Greta Margaret, the wife of Frederick Rawlinson Cooper, M.P.S., of a son.

MARRIAGES

Campbell—Stewart.—At Braid Church, Edinburgh, on June 19, Neil Campbell, Ph.D., to Marjory, eldest daughter of the late Mr. Charles Stewart, M.P.S., Edinburgh.

CRUMMY—CLEWORTH.—At St. Edmund's Church, Whalley Range, Manchester, on June 22, Lieutenant Norman Eastwood Crummy, L.D.S., only son of Mr. J. Crummy, dentist, Middleton, to Bessie Cleworth, L.D.S., younger daughter of Mr. John Cleworth, M.P.S., Whalley Range.

Macfadzean—Sproull.—On June 11, Robert Wallace Smith Macfadzean, M.P.S., to Leana Jane Mary Sproull.

DEATHS

Barnes.—Recently, Mr. Hubert Barnes, M.P.S., 46 Nelson Drive, Cadishead, Manchester. Mr. Barnes passed the Qualifying examination in 1935.

KING .- At Worthing, recently, Mr. Edwin Frederick King, chairman and managing director of Stephen Smith & Co., Ltd., London, E.3, aged seventy-two.

MILLS.—At 1464 London Road, Norbury, London, S.W.16, on June 23, Mr. Edward Francis Mills, M.P.S., aged sixty-four.

Mackay.—Recently, Mr. Allan Mackay, M.P.S., Wallisdown, Bournemouth, aged fifty-five.

MAXWELL.—At Londonderry, on June 21, Mr. John Maxwell, M.P.S.N.I., proprietor of Prior & Co., chemists, and a former president of the Pharmaceutical Society of Northern Ireland (see p. 458). Mr. Maxwell took over the business of Prior & Co. in 1904, having entered the firm in 1890. He passed the Minor examination of the Pharmaceutical Society of Great Britain, and then crossed to Ireland, spending a couple of years with Grattan & Co., Ltd., Belfast, before settling down in Londonderry. Among other offices Mr. Maxwell has held are the presidency of the local Chemists' Association and of the Burns Club.

PAVEY.—Recently, Mr. Henry John Pavey, chemist and druggist, Tenterden, aged eighty-one.

STURDY.—Recently, Mr. John Robert Sturdy, Ph.C., Cilesta, Notch Hill, British Columbia, aged seventy-eight.

Tyler.—Recently, Mr. Charles Skelton Tyler, chemist and druggist, Hamilton Road, Felixstowe, aged seventy-six.

PERSONALITIES

LIEUTENANT J. N. GIBBS, who has been awarded the Military Cross for gallantry in the field during the recent operations in

France and Belgium, is in peacetime the representative in the West Midlands of County Perfumery Co., Ltd.

QUARTER - MASTER SERGEANT LOWTHER R. NICHOLSON, R.A.M.C., has been officially notified by the War Office as missing. It is understood that his field ambulance was surprised and overcome by German tanks on May 28. He served his apprenticeship with Mr. E. Neathercoat, qualified in 1929, and had served as secretary and as chairman of the Medway Branch of the Pharmaceutical Society. With him in the ambulance was Sergeant "Bob" Jeffery, who had been associated with him during his ten years' term as senior assistant at Corfe & Son, Maidstone.



LIEUTENANT J. N. GIBBS

COUNCILLOR ROBERT GRIFFITH EDWARDS, Ph.C., Amherst Road' Fallowfield, Manchester, is to be the next Lord Mayor of the city. He represents Rusholme ward and has been a councillor since 1924

Mr. Allan J. Holden, B.Sc., F.I.C., has been appointed secretary of the British Colour Makers' Association to replace Mr. J. Davidson Pratt, who has undertaken special duty at the Ministry of Supply.





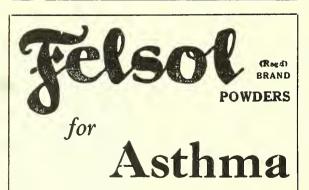
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PARLIAMENTARY NEWS

Restriction of Catalogues.—In answer to a question by Mr. Touche on June 10, Mr. H. Macmillan, for the Minister of Supply, said that it was improbable that further quantities of paper would be made available for brochures and catalogues sent out by stores.

Employment in Distributive Trades.—The Parliamentary Secretary to the Ministry of Labour stated in reply to Mr. Rhys Davies on June 20 that statistics as to the number of insured males and females in the distributive trades at the beginning of September 1939 and at the last available date were not sufficient to enable comparative figures to be given.

Prices of Goods Act Prosecutions.—Asked on June 18 how many complaints of overcharging had been dealt with by the Central Price Regulating Committee; how many prosecutions had been recommended; and how many convictions had been obtained, Sir A. Duncan (President of the Board of Trade) replied that the Central Committee had received from local committees recommendations for prosecutions in twenty-nine cases. Requests for proceedings had been made by the central committee in twenty-four cases; of these nine had been heard and convictions obtained in all of them.

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Garden pests and diseases.—An illustrated brochure has been issued by the Ministry of Agriculture and Fisheries dealing with some of the more common pests and diseases affecting food crops in gardens and allotments and intended as a supplement to the Ministry's "Growmore" Bulletin No. 1 ("Growmore" Bulletin, No. 2, H.M. Stationery Office, price 6d.). The booklet, which covers twenty-six pages, deals with measures of control of the pests and diseases in the vegetable garden, insecticides, fungicides, sprays and dusts, apparatus, etc.

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Officiat organ of The Pharmaceuticat Society of Iretand, The Pharmaceutical Society of Northern Iretand, The Chemists' and Druggists' Society of Iretand and of other Chemists' Societies in the Empire

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Annual Special Issue

WE are convinced that we are fulfilling the wishes of our readers at home and abroad in presenting this, our first war-time Annual Special Issue. We pray that the next annual number of this kind will reach them under happier conditions. The contents have of necessity had to be limited this year, but we believe that the articles contributed by well-known authorities on the various subjects will leave nothing to be desired on the score of quality, variety and general interest.

With the present restriction on the consumption of metals, manufacturers will be seeking new types of containers and packages, and for certain classes of goods plastics offer something more than a war-time substitute. "Pharmacy before Printing" reviews some priceless manuscripts evacuated from the British Museum and places on record authoritative information on early pharmaceutical practice. Every pharmacist will read with interest "Pharmacy in the Royal Navy." We acknowledge the courtesy of the senior service in permitting the publication of this topical feature. An article on "The Rose Case" gives a clear insight into the conflict which existed between the physicians and apothecaries of the seventeenth and eighteenth centuries. In contrast, purely scientific articles on ergot germination, chlorophyll and sex hormones have been included. That the designation "Ergot of Rye" has some significance is seen from the fact alluded to in the article that the fungus has been collected from other grasses and that the activity of such sclerotia is not necessarily identical with that of the products taken from rye. The subject of sex hormones has now taken such an important place in modern medicine that all pharmacists should possess a working knowledge of the nature of these substances and their applications. The article devoted to the subject covers in a straightforward and concise manner a historical account of the introduction of hormone therapy, the physiology and chemistry of hormones and also their commercial production and clinical uses. In a similar manner, the article on chlorophyll condenses into a short space an informative résumé of present knowledge of this substance. Finally, as a supplement, we include, at the request of the authorities, reproductions of enemy troop-carrying aeroplanes.

Pharmacies as First-aid Points

In last week's C. & D. we called attention to the need for more facilities to deal with air-raid casualties, and the failure on the part of the authorities to make use of the abilities of chemists and their premises—even to the extent of a deadlock regarding payment for dressings that might be used on an injured person. The Ministry of Health has virtually maintained the attitude it took up last April, the only modification being that under certain conditions (see p. 455) chemists may now treat a casualty, and, provided records are kept, they will receive payment from public funds if the injured person cannot pay for dressings used.

This retraction is far from sufficient, and neither chemists nor their representative organisations should allow the matter to remain at this stage. Chemists are aware of the need of revision of present arrangements, as is evident from letters we have received, and that they are anxious to co-operate with local authorities is shown not only in the C. & D. but by recent paragraphs in the lay Press, including the "News Chronicle," the "Manchester Guardian," and the "Bath and Wilts Chronicle." The feelings of chemists are admirably stated in the last-mentioned (under the title "Chemists ready to help") as follows: "The importance of the part which would be played by chemists in the event of air raids locally is emphasised in a timely letter I have received from Mr. E. C. Haskins, M.P.S., of 34 Bathwick Street, Secretary of the Bath and District Branch of the National Pharmaceutical Union. 'A number of Bath retail chemists,' he says, 'have taken gas courses and first-aid lectures, subsequently passing the examinations in these subjects. They are thus in a position to give useful advice and guidance to members of the public in A.R.P., first aid, etc. In the event of a raid in Bath, members of the public who require treatment will, no doubt, go to chemists in their neighbourhood as soon as possible, for attention to minor injuries, burns, etc., a supply of dressings for which purpose is always maintained in chemists' shops in all districts.

Though it may be the view of the Ministry of Health that there are sufficient first-aid posts, the fact remainsth at it would be better to have too many than too few. We sincerely hope that present arrangements will suffice, but this is not the impression obtained on investigating in various areas the location of the official posts and the number of persons they are intended to serve.

Export Trade Well Maintained

In a recent editorial article on the progress of the export drive (C. & D., May 25, p. 389), the hope was expressed that the May figures for Britain's export trade would not suffer seriously as a result of the invasion of the Low Countries. That this hope has been fulfilled is evident from the official overseas trade returns for the month, which show that, notwithstanding circumstances tending to restrict British seaborne trade, the export figures have been well maintained. Exports of United Kingdom goods during the month under review totalled £45.5 millions, compared with £42.3 millions in the corresponding month of the previous year—an increase of about 8 per The May export figure for chemicals and allied products reached a total of over £3 millions, placing this group high on the list of manufactured export products. Apart from April of this year, when a slightly higher figure was recorded, the May exports of chemicals and allied products were the highest for twenty years. The following table shows, in the first line, exports of chemicals and allied products for the months of May 1938, 1939, and 1940 respectively, and, in the second line, export figures for the same group of articles for the five months ended May 31 of the same years:-

1938	1939	1940		
May, 1,891,267	2,384,440	3,077,219		
Jan.–May, 9,294,366	9,740,185	14,266,837		

Re-export figures for May show a decline of £1.2 millions compared with the preceding month, but are only £0.25 millions less than the average for the five months of the year. It is satisfactory to note that, so far as chemicals and allied products are concerned, the reexport figures for May 1940 are actually higher than those for April and are more than double those for April 1939. Imports of chemicals and allied products during May totalled £1.9 millions, compared with £1.8 millions in April 1940 and £1.7 millions in May 1939. The total import figure for all goods for May 1940 is £105.6 millions, or £27 millions more than in the corresponding month of 1939. This increase is largely accounted for by additional imports of raw materials. The May figures, however, are lower by $f_{4,4}$ millions than those of the preceding month, so that the excess of imports over exports of $f_{5,8}$ -6 millions is practically the same as the figure recorded for April.

PROTEOLYTIC ENZYMES

THE degradation of proteins into constituent amino-acids and the rebuilding of these components into specific proteins is undoubtedly the most important feature of the processes of life. The biological specificity of the l-amino-acids as units from which peptides, peptones, proteins and protoplasm are formed gains in significance from the new evidence that proteolytic enzymes (or intracellular proteinases) are in effect proteins. In the living cell these seem to have the capacity of synthesising replicas of themselves from a suitable substrate of such amino-acids and producing other proteins at the same time.

A systematic survey of the specific characteristics of proteolytic enzymes shows that the knowledge obtained by working with crystalline proteinases profoundly modifies the older ideas as to the nature of enzymes and removes them from the category of living matter with a vital activity outside the range of experimental science. Modern methods have proved that certain proteinases (e.g., pepsin and trypsin) are crystalline proteins with a physiological activity dependent upon the structure of the protein molecule as a whole. It is true that their proteolytic action is exhibited in dilution so great that the presence of protein cannot be detected by chemical tests, but the reversible rôle of proteolytic enzymes in synthesising as well as hydrolysing proteins agrees with their "catalytic" nature being a property of the protein and not due to the presence of traces of impurity. In particular, the manner in which specific enzymes attack different types of amino-acid linkage has resulted in a systematic classification of proteolytic enzymes which accords with their digestive action in the alimentary canal of animals.

Classification.—Proteolytic enzymes are secreted by all animal and vegetable tissues including bacteria and moulds. The new basis of classification comprises:-

(1) PROTEINASES.—These attack the middle of a peptide chain and hence are also known as "Endopeptidases." These include:—

(i) Pepsin, present in gastric juice;

(ii) Trypsin and chymo-trypsin, from pancreatic juice; (iii) Cathepsin, an intracellular enzyme in liver and kidney tissues;

(iv) Papain, from the fruit of Carica papaya;

(v) Bromelin, present in the pineapple.

(2) Peptidases.—This group splits the peptide (—CO.NH—) linkage at the end of the chain and its members are thus called Exopeptidases," viz.:-

(vi) Carboxypeptidase, from pancreas, moulds and yeast; (vii) Aminopeptidase, from intestinal mucosa, moulds and yeast.

[These require one activating group (COOH and NH2 respectively) near the peptide link.

(viii) Prolinase and dipeptidase, from intestinal mucosa and yeasts, the latter being also present in liver, kidney and moulds.

[Two activating groups must be present in the peptide chain for hydrolytic action.]

(3) Prolidase.—The activity of this group is limited to splitting the amino (-CO.N() group present when proline forms the peptide linkage.

The order of attack of proteolytic enzymes in the digestive tract follows that necessary for successive cleavage of proteins into their ultimate amino-acid constituents, viz.:

I. The gastric proteinase (pepsin) of the stomach readily attacks globular proteins (albumins, globulins, etc.) in an acid substrate, forming proteoses and peptones, and releasing some 10 to 20 per cent. of the total amino-N. The relatively rapid primary hydrolysis is followed by slow degradation to simpler products but in general the action appears to be limited to the hydrolysis of peptide linkages forming the molecular meshwork.

2. The pancreatic proteinases (trypsin and chymo-trypsin) also hydrolyse high molecular weight proteins to about the same extent as peptic digestion but differ by operating in slightly alkaline medium and in attacking other peptide linkages. The presence of peptidases continues the splitting of the polypeptides into simple peptides. The amino-N liberated may attain 50 per cent.

3. The completion of the hydrolysis of peptides into amino acids is effected by the exopeptidases of the small intestine. The free amino-N content can attain the same value as that obtained by chemical hydrolysis with acid.

Specificity.—The specific nature of enzyme action is one of the most striking features of the chemical processes performed by living

organisms. Complex proteins and stable carbohydrates are split with ease by enzymes into the precise products necessary for nutrition and growth. The fact that such action could not be duplicated under laboratory conditions led to enzymes being regarded as catalytic agents endowed with a vital activity in order to account for an apparent lack of energy exchanges during hydrolysis by means of enzyme action. Proteolytic enzymes derive their properties from the presence of specific groups interacting with different types of peptide linkages. Evidence is rapidly accumulating to prove that the specificity depends upon the structure of the reacting molecules. This corresponds to the old "lock and key" theory of catalytic action with the difference that the relation between peptide and enzyme can now be explained in terms of chemical configuration. The vital value of this controlling factor as regards the specific action of proteolytic enzymes is emphasised by the fact that only peptide linkages from optically active l-amino-acids (similar to those occurring in natural proteins) are acted upon by proteolytic enzymes. The relation between peptide linkage and enzyme specificity is best explained by proceeding from the simple peptides to more complex proteins.

Prolidase proffers the simplest example of the specific connexion between peptide structure and enzyme configuration. The action of prolidase is apparently limited to the splitting of peptides in which the amino group of proline is present in the peptide link. Thus it hydrolyses glycylproline and *l*-alanyl-*l*-proline.

$$\begin{array}{c|c} H_2C - CH_2 \\ H_2C - CH \cdot COOH \\ \\ CH_3 \cdot CH(NH_2) \cdot CO - N \\ \\ \textit{l-alanyl-l-proline} \end{array}$$

DIPEPTIDASE only attacks dipeptides with the normal peptide bond formed between the amino-group of one l-amino-acid and the carboxyl group of another. In addition to such peptide linkage there must be hydrogen atoms in the (three) positions shown

$$H$$
 R' H R NH_2 C $COOH$

All peptides containing natural amino-acids contain the activating groups at the end of the chain and will be split by dipeptidase. Removal of either the amino or carboxyl groups from the α-position or the absence of such free groups prevents hydrolysis.

Prolinase splits peptide linkages formed between the carboxyl group of proline and an l-amino-acid. Prolylglycine and peptides of this type are acted upon by prolinase only.

Aminopertidase attacks the end of the peptide chain when this carries a free amino group. Thus it hydrolyses glycylglycyl-l-leucine to glycine and glycyl-l-leucine.

e and glycyl-*l*-leucine.
CH . CO – NH . CH₂ . CO — NH . CH . COOH | NH₂ |
$$C_4H_9$$
 | C_4H_9

This enzyme, like dipeptidase, prolinase and carboxypeptidase, requires for its action a hydrogen atom on the peptide linkage adjacent to the free amino group.

CarboxyPeptidase splits peptides with a free carboxyl group at the end of the chain and adjacent to the peptide linkage, i.e., of the type:-

Carboxypeptidase differs from other exopeptidases in hydrolysing compounds such as chloracetyl-l-tyrosine which contains the two

activating groups but are not true polypeptides. Its action is inhibited by a free amino group adjacent to the peptide linkage and hence most dipeptides are not split by this enzyme.

PROTEINASES attack the middle of peptide chains and require two peptide linkages as activators, preferably without free amino and carboxyl groups. The structural type, which is present in all proteins, is as follows:—

In the breakdown of proteins to peptides, various proteolytic enzymes (e.g., chymotrypsin and papain) attack different linkages. Free amino and carboxyl groups are liable to inhibit hydrolysis by proteinases in different ways. This papain is inactivated by a free amino group at the end of the chain and chymotrypsin by a free carboxyl group in this position. The specific selectivity of proteolytic enzymes appears from the above examples to be dependent upon the asymmetry of the enzyme molecule complementing the stereochemical structure of the *l*-amino-acid units composing the peptide chains present during the hydrolysis of proteins to peptides and thence to amino-acids. In this connexion it is noteworthy that the free amino and carboxy groups which activate the peptidases inhibit the activity of proteinases.

Crystalline Enzymes.—The preparation of proteolytic enzymes in a crystalline state supports the identity of enzymic activity with that of the protein molecule. The crystalline enzymes include peptic and tryptic enzymes and the properties of pepsin and trypsin free from impurity is of especial interest to pharmacists.

Pepsin crystallises in regular hexahedra with a tendency to form clusters from acid solution. The crystals show positive double refraction and solutions therefrom are optically active. The proteolytic activity of pepsin crystals as measured by hydrolysis of casein is equivalent to five times that of the pepsin of commerce designated as I: 10,000 standard. Crystalline pepsin has an isoelectric point close to pH 2.7 which is thus also its point of minimum solubility. The amino-acid constitution of pure pepsin is markedly different from that of any other known protein. The basic-N values are extremely low and amino-acid yield on hydrolysis extraordinarily high. The molecular weight from sedimentation data (37,000) and osmotic pressure (35,000) is in close accord with that of fundamental unit (36,500) suggested for the globular protein molecule. The x-ray pattern of pepsin is that of a typical protein crystal, the dimensions of the unit cell being: $A = 67 \, \text{A}^{\circ}$ and $C = 154 \, \text{A}^{\circ}$ The phenolic OH groups of tyrosine are evidently closely connected with the activity of the pepsin molecule as their acetylation results in a decrease in proteolytic action whereas acetylation of the primary amino groups of lysine units has little or no effect. Pepsin denatured by alkali (at ph 10.5) recovers part of its activity in nearly neutral solution (at ph 5·4), but inactivation by strong acid results in total loss by hydrolysis. Crystalline pepsin possesses a milk-clotting power or rennet activity which is constant as compared with the small variation in ratio of rennet to pepsin activity present in commercial pepsins. Pepsinogen, the precursor of pepsin, has also been isolated in a crystalline condition. Its transformation into pepsin in solution more acid than рн 6-о is autocatalytic, i.e., the pepsin produced catalyses the reaction. About 15 per cent. of non-protein nitrogen is split off from the pepsinogen molecule during its transformation into pepsin. The peptic activity of pepsinogen to gelatin at ph 4.5 is negligibly small, and pepsinogen is also devoid of rennet activity. Commercial pepsin contains a small amount of an enzyme (known as gelatinase) which is exceedingly active in liquefying gelatin. This, and another enzyme which is also present, represent a negligible part of the total proteolytic activity of the pepsin of

Chymo-trypsin and carboxypeptidase) which have been isolated from pancreatic juice. The fresh juice does not possess proteolytic properties and the mechanism of activation has been a controversial subject which has only been solved in recent years by the isolation of the enzymes and their precursors. Chymo-trypsin crystallises in rhombohedrons and has an isoelectric point at \$\rho\$H 5.4. The molecular weight from osmotic pressure corresponds to \$41,000. The \$\rho\$H optimum for digestion of casein is 8 to 9. Casein is hydrolysed more completely by chymo-trypsin than by trypsin, but neither carries the splitting far. The two enzymes effect hydrolysis at different peptide linkages and in combination carry proteolysis to the polypeptide stage. Chymo-trysinogen after purification by repeated crystallisation can only be activated by trypsin, the rate of reaction being proportional to the concentration of trypsin and thus related to the hydrolytic action of this enzyme.

Trypsin on crystallisation forms short prisms. The pure protein has the peculiar property that its slightly acid solution may be boiled for a short time without permanent loss in activity. Inactivation of the enzyme is brought about almost instantaneously by rise in temperature or making the solution strongly alkaline but reversion to active state takes place on standing at $p\rm H$ 2-0 and 20° C. Crystalline trypsin does not carry hydrolysis of casein as far as pepsin and the rupture occurs at different linkages. Digestion of casein by trypsin is at an optimum at $p\rm H$ 8-9. The molecular weight of trypsin (from osmotic pressure) is 36,500. Its isoelectric point is about $p\rm H$ 7-0. Trypsin is rapidly digested and inactivated by pepsin in acid solution. Trypsinogen, the precursor of trypsin, has been isolated in the form of small triangular prisms, which, in neutral solution, are rapidly transformed into trypsin, the enzyme accelerating the (autocatalytic) reaction.

CARBOXYPEPTIDASE has been prepared from autolysed beef pancreas as a water-soluble crystalline protein. The fresh pancreas does not contain the enzyme but a precursor, pro-carboxypeptidase, which is activated by trypsin.

Activation and Inhibition.—The investigations on pancreatic enzymes explain factors in the mechanism of enzyme production which are of vital importance in arriving at an understanding of the breakdown of proteins by the digestive processes of animals. The juice secreted by the pancreas is devoid of proteolytic activity containing only the precursors of the enzymes which are protected from activation by a "trypsin-inhibitor." This is a compound of one molecule of trypsin with one molecule of inhibitor. The inhibiting action is overcome by enterokinase (from the small intestine) which forms sufficient active trypsin to transform chymo-trysinogen into chymo-trypsin and also catalyse trypsinogen and pro-carboxypeptidase. Chymo-trypsin and trypsin in admixture carry proteolysis further because they attack different peptide linkage, and the polypeptides produced are split again by carboxypeptidase into simple peptides. Thus the digestion of proteins begins with peptic action in the stomach, and continues with tryptic attack in the duodenum, with amino-acid formation being completed by the exopeptidases of the intestinal tract.

Protein Synthesis.—From the catalytic character of proteolytic enzymes it follows that the change from protein to peptides and amino-acids should be reversible by suitable changes in the substrate affecting the direction of the reactions. In other words proteinases should be able to synthesise the proteins they hydrolyse. Synthetic products (plastein) formed by pepsin in peptic digests of egg albumen at pH 4·0 have molecular weights (1,000 or less) far removed from that of proteins proper. However the fact that proteolytic enzymes are proteins which can rupture the peptide linkages of specific chemical structures makes reunion (or protein synthesis) simply a matter of dehydration replacing hydrolysis.

The ph value of the substrate influences the synthetic or analytic activity of proteolytic enzymes in relation to appropriate proteoses, peptones and amino acids. Thus pepsin possesses an optimum at pH 4 for making the peptide link, as compared with ph 1.7 for breaking it. The knowledge of the relation between enzyme action and chemical structure is derived from the degradation and death of the protein. Nevertheless it is no longer assumed that breakdown of a protein is brought about by one enzyme and its reconstruction by another. Instead biologists recognise that the reaction between enzyme and protein is reversible owing to the ability of the living cytoplasm to regulate conditions and concentrations in the substrate by which it is surrounded. In the living cell the removal of protein from the sphere of action and the renewal of supplies of suitable units in the substrate provide the primary basis for growth and reproduction, hydrolysis and synthesis of proteins proceeding simultaneously. The proteolytic enzymes are in themselves proteins with structural patterns for capturing the products they unite into proteins or holding the proteins they disintegrate. Life itself concerns the co-operation of such ordered structures in ordered sequence. The formation of a specific protein is evidently a succession of reactions reversing the hydrolytic breakdown. The configuration of the l-amino-acid units is specific as also the enzymes and the linkages

The difference between life and death is illustrated by the synthesis of proteins in the living cell and their autolytic degradation in dead tissues. The reaction after death can only proceed in the direction of hydrolysis and disruption. Only in living tissue can proteolytic enzymes catalyse the hydrolysis of proteins and rearrange the aminoacids into new types. The complicated sequence of exchanges has a simple basis in the correlation of enzyme activity with chemical configuration. The isolation of proteolytic enzymes as crystalline proteins proves that their catalytic character is a matter of molecular structure instead of a question of vital activity of unknown origin.

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TRADE REPORT

Spot quotations recorded for pharmaceutical chemicals, crude drugs, essential oils, etc., represent the prices for wholesale quantities of standard quality. C.i.f. shipment quotations do not include marine war risk insurance and other abnormal charges which arise under the present state of emergency

28 Essex Street, W.C.2, June 26

Business in most markets has been quiet this week, with buyers and sellers inclined to wait for the outcome of recent international developments. A fair to moderate spot business is passing, and prices are generally firm. In Pharmaceutical Chemicals, recent changes in values are being maintained. Advances in prices are announced for Borax, Boric acid and Opiates. A moderate spot business has been moving in Crude Drugs and most products are keeping fully steady to firm. Fair arrivals of Agar are reported, and all are firmly held. The spot value of Sudan Gum acacid has again advanced; shipment values are nominal. Honey is quiet and steady. Spot stocks of Matto Grosso Ipecacuanha continue to be firmly held. A steady consuming demand is reported for Japanese Menthol. Mercury is steady at the advanced price recorded last week. Pepper continues nominal. Senega is firmly held on spot. There are no arrivals of Alexandrian Senna. Carnauba wax is easier on spot. The demand for Essential Oils has been quiet. Oils from metropolitan France will no longer be available, but supplies of oils from the French Colonial Possessions obviously depend upon the political fate of those territories—which is still problematical. Rather more inquiry is reported for Anise (star). Bergamot continues nominal. More interest is being shown in Cassia. Sicilian hand-pressed Lemon continues nominal; Californian is firm. Genuine Californian Grapefruit is also firm. Japanese Peppermint is rather quiet, A fair to moderate spot business is passing, and prices are generally firm. Californian Grapefruit is also firm. Japanese Peppermint is rather quiet, but American natural oil is firming up.

Exchange Rates on London

The following is a list of the chief Continental and other exchange rates at the opening on Wednesday morning:-

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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Centre Q		Quoted	Par	June 19	June 26	
	Brussels Buenos Aires Copenhagen Lisbon Madrid Montreal New York Oslo Paris Shanghai Yokohama		Belgas to f. Paper pesos to f. Kr. to f. Esc. to f. Ptas. to f. Dols. to f. Kr. to f. Fr. to f. Per dollar Kr. to f. Per yen	nominal 18-159 110 25:24½ 4:86¾ nominal 18-159 124:21	100 39·50 4·45* 4·03* 	100½ 37 4.45* 4.03* — 3½d. 16.90* 15.3&d.	

* Rate fixed by Bank of England. Bank rate, 2 per cent.

Pharmaceutical Chemicals, etc.

There are no substantial changes to report in these markets. Business is on the quiet side, with values generally steady. Advances are announced in borax, boric acid, and opiates.

Acetanilide.—Steady, quiet. B.P. leviss., for prompt delivery, from 2s. 2d. to 2s. 6d. per lb., according to quantity.

Amidopyrine.—Business is slow. One cwt., 198. per lb., quantities, up to 23s. per lb. for crystals, with powder 3d. per lb. extra. ASPIRIN.—Makers' prices are steady and unchanged:-

Quantity		In containers of						
		ı lb.	2 lb.	4 lb.	7 lb.	14 lb.	28 lb.	
I lb. and under 4 lb. 4 lb. and under 7 lb. 7 lb. and under 12 lb. 14 lb. and under 12 lb. 18 lb. and under 1 cwt. Not less than 1 cwt 11, 12, 13, 10 cwt 12, 11, 12, 13, 14, 15, 15, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16		s. d. 3 10½ 3 9½ 3 8½ 3 7½ 3 6½ 2 11½ 2 11	s. d. 3 9 3 8 3 7 3 6 3 5 2 10 2 9 2 8 2 2 8 2	s. d. 3 744 3 644 3 544 2 944 2 944 2 84	s. d. 3 611 3 511 3 411 2 911 2 811 2 71	s. d. 3 5 3 4 2 9 [*] 2 8½* 2 7½*	s. d. 3 3½ 2 8½ 2 8½ 2 7	

* 8 × 14 lb. and upwards in one delivery, ½d. per lb. less.

Sale is subject to an undertaking on part of buyer not to re-sell any quantity at prices or terms below scale for such quantity current at time re-sale is made, and, if he converts the aspirin into tablets, not to sell any quantity of tablets at prices or terms below scale for such quantity current at time of sale.

Barbitone.—Market is quiet: Spot, one cwt., 22s. per lb.; 28 lb., 23s.; smaller quantities, up to 26s., ex store.

Benzaldehyde.—Some inquiry; market continues firm. Makers quote from 2s. 9d. to 3s. per lb., as to quantity.

Benzoic acid (B.P.).—Steady, fair demand. Quoted at from 2s. to 2s. 3d. per lb. for forward delivery.

Benzyl Benzoate.—Quoted unchanged at about 2s. 9d. to 3s. per lb., with supplies limited.

BORAX (B.P.).—Makers' prices have been advanced; the new prices are as follows: Granulated, £31; crystals, £32; powder, £32 10s., in 1-cwt. bags, carriage paid in Great Britain, for minimum one-ton lots. Commercial quality, £8 per ton less.

Boric acid (B.P.).—Makers' prices have been advanced; the new prices are as follows: Granulated, £45 10s.; crystals, £46 10s.; powder, £47 10s. per ton, in cwt. bags, carriage paid in Great Britain, for minimum one-ton lots. Commercial qualities, £8 per ton less.

Bromides.—Makers' prices quoted unchanged: Potassium (B.P.), not (B.P.), not less than 5 cwt., 2s. 2d. per lb.; I cwt., 2s. 3d.; 28 lb., 2s. 9\frac{1}{2}d.; 28 lb., 2s. 9\frac{1}{2}d.; 28 lb., 2s. 6\frac{1}{2}d.; 28 lb., 3s. 6\frac{1}{2}d.; 28 lb., 3s. Id. Net. Rise-and-fall and re-sale clauses apply. Without engagement. Special prices for larger quantities. 28-lb. parcels and 1-cwt. cases or kegs free.

Caffeine.—The following would be the spot prices for any available foreign material: Pure, less than 56 lb., 23s. 6d. per lb.; 56 lb., 23s.; 1 cwt., 22s. 6d. Citrate, less than 56 lb., 16s. per lb.; 56 lb., 15s. 6d.; I cwt., 15s. per lb.

CITRIC ACID (B.P. CRYSTALS).—Quoted unchanged; makers' price for home consumers is nominal at 1s. 2d. per lb., less 5 per cent. discount.

CREAM OF TARTAR (B.P.).—One maker notifies a nominal price for home trade of 127s. per cwt., less $2\frac{1}{2}$ per cent. discount, with supplies restricted to regular consumer customers. Another maker quotes a nominal price of 140s. per cwt., with only limited supplies available.

CREOSOTE (BEECHWOOD).—No change in dealers' quotations of about 4s. 6d. for bulk quantities in 25-kilo demijohns; for smaller quantities, up to 5s. per lb., ex store.

Guaiacol Carbonate.—Not much business passing; makers and dealers quote from 12s. 6d. to 13s. per lb., ex store, as to quantity.

Gualacol (Crystals).—Makers continue to quote at from 10s. 9d. to 11s. 6d. per lb., as to quantity. Liquid, from 10s. 6d. upwards, as to quantity.

Lactic acid (B.P.).—Small inquiry; quotations unchanged. Quantities, in 1-cwt. carboys, 1s. 8½d. per lb.; in winchesters and bottles, 1s. 9d. to 2s. per lb., ex store, according to quantity.

OPIATES.—Makers announce new basic prices as follows:—Morphine.
—Alkaloid, 32s. 6d.; meconate, 32s. 6d.; tartrate, 32s. 6d.; acetate, 26s. 6d.; hydrochloride, 26s. 6d.; sulphate, 26s. 6d. Codenne.—Alkaloid, 32s. 6d.; hydrochloride, 29s. 6d.; sulphate, 29s. 6d.; phosphate, 26s. 6d. Diamorphine.—Hydrochloride, 32s. 6d. Ethylmorphine.—Hydrochloride, 29s. 6d. All prices are per oz. Subject to usual discount. Packages and account from the company of the contract of the country for the contract of the country for the country f ages: 4 oz. and over, free.

PHENACETIN.—Makers' prices for ordinary quantities continue at from 3s. 6d. to 3s. 9d. per lb., and quotations are given without engagement. Little material is in dealers' hands, and prices continue firm at about 6s. 9d. to 7s. per lb.

Phenazone.—Dealers' prices range between 18s. per lb. for bulk quantities and 22s. for small parcels, ex store.

PHENOLPHTHALEIN.—Makers' prices are firm. Less than 7 lb., 3s. 8d. per lb.; 7 lb., 3s. 7d.; 14 lb., 3s. 6d.; 28 lb., 3s. 5d.; one cwt., 3s. 4d.

PHENYLETHYLBARBITURIC ACID (B.P.).—Limited supplies on spot. Quotations continue firm at from 30s. to 32s. 6d. per lb., in bottles, according to quantity.

PIPERAZINE.—About 75s. per lb. would be the price for bulk quantities; small lots, in 1-oz. bottles, 5s. 6d. to 6s. per oz.

RESORCIN.—Steady; quotations unchanged: Not less than 7 lb., 7s. 3d. per lb.; not less than 14 lb., 7s.; not less than 56 lb., 6s. 1od.; not less than 1 cwt., 6s. 9d. Dealers would require about 8s. 6d. to 9s. per lb. for any spot material available.

Rochelle Salts.—Makers' prices for Sodium and Potassium tartrate, ROCHELLE SALTS.—Makers' prices for Sodium and Potassium tartrate, B.P., are steady at the recent advance: Powder, less than 1 cwt., 132s. 6d.; less than 5 cwt., 130s.; not less than 5 cwt. in one delivery, 127s. 6d.; crystals, 2s. 6d. per cwt. extra. Pulv. seidlitz.—Less than 1 cwt., 103s. 9d.; less than 5 cwt., 101s. 9d.; not less than 5 cwt. in one delivery, 100s. per cwt. Double seidlitz.—Less than 1 cwt., 116s.; less than 5 cwt., 113s. 9d., not less than 5 cwt. in one delivery, 111s. 6d. per cwt., net, from fourteen days, without engagement; contracts subject to rise-

Saccharin.—Convention price for 550 is at 98s. 4d. per lb., duty paid, with supplies limited.

SALOL.—Firm and unchanged at about 6s. od. to 7s. per lb., as to

Sodium barbitone.—Quiet; quotations unchanged: One cwt., 23s. per lb.; 28 lb., 24s.; smaller quantities, 77s., ex store.

SODIUM BENZOATE.—Good inquiry: firm. Quoted at from 1s. 10d. to 2s. per lb.

Tartaric acid (B.P. crystals).—Makers' quotation is now nominal at is. 8d. per lb., less 5 per cent. discount, with supplies reserved to regular consumer customers. Any foreign material on spot would be worth about 2s. 3d. per lb.

Vanillin.—Limited supplies only available; quoted unchanged. Ex clove oil or guaiacol, five cwt. 14s. 6d. per lb.; one cwt., 14s. 7\frac{1}{2}d.; 56 lb., 14s. 9d.; less than 56 lb., 15s., carriage paid in the United Kingdom.

Crude Drugs, etc.

A fair to moderate spot business is moving in these products, and most

AGAR.—A fair consuming demand, with spot values unchanged from those detailed last week. No shipment offers are available from Japan, but there have been fair arrivals recently and all are firmly hold.

Alkanet root.—About 80s. per cwt, would be the value of spot material, ex store, if available.

Aloes.—A small spot demand for Curação continues, the value being about 300s. per ewt., ex store. Some shipment offers have arrived from origin via New York at about 230s. per cwt., c.i.f., but no business is reported done at this figure. Cape is steady; spot, about 57s. 6d. to 60s. per cwt. Zanzibar leaves about 90s. per cwt., ex store.

During the three months ended March 31, 193,890 lb. of aloes, valued at £2,426, was exported from the Cape, compared with 250,676 lb., valued at £3,607, during the corresponding period of the previous year.

Antimony.—Quotations unchanged; market quiet. English regulus, f106; Continental regulus, f99 per ton, duty paid; Chincsc, crudc, f98

per ton. Balsams.—Tolu would be worth about 7s. 6d. per lb. for any material available. Canada, valued about 5s. 6d. per lb. Copaiba, Para, is quoted at about 3s. 6d. per lb.; and Peru, about 8s. 9d. per lb., duty paid. Business is along quict lines.

Benzoin.—Rather better demand. Sumatra is quoted steady on spot at from £5 ios. to £6 ios. per cwt., according to quality.

BISMUTH METAL.—Continues to be quoted at one dollar 25 cents per lb.,

Buchu.—Little interest is being shown. Spot values are unchanged from the figures given last week.

During the three months ended March 31, 92,429 lb. of buchu leaves, valued at £9,690, was exported from the Cape, compared with 70,907 lb., valued at £2,944, in the corresponding period of the previous year.

Camphor.—In steady demand, with prices of tablets and slabs unchanged. No shipment prices available from origin. Continental synthetic powder, 5s. 3d.; tablets, 5s. 6d. per lb., ex store. English makers of refined quote the following prices: Flowers, one cwt., 5s. 9d.; 28 lb., 5s. 10d.; less than 28 lb., 5s. 11d. per lb. Transparent tablets, \(\frac{1}{4}\)-oz., one cwt., 6s. 3d.; 28 lb., 6s. 4d.; less than 28 lb., 6s. 5d. per lb.

Cardamoms.—Market dull but values generally unchanged: Ceylon, spot, about 3s. 6d. to 5s. per lb., according to quality; Bombay seed, about 4s. 6d. per lb.; Mangalore seed, about 4s. 3d.; Aleppy greens, about 3s. 2d. per lb.

CASCARA SAGRADA.—Fair business is passing in 1938 and 1939 peel at about 95s. upwards per cwt., duty paid, according to age. New-crop peel is offered from source at around 66s. per cwt., c.i.f., but no business is reported.

Cloves.—Market quiet; quotations unchanged. Zanzibar, spot, 9d. per lb.; shipment, Junc-July, 9d., c.i.f.; Madagascar, sellers, 9\frac{1}{3}d., in bond; shipment, June-July, 9\frac{1}{3}d. per lb., c.i.f.

COCOA BUTTER.—Market quiet. Prime English offered at 1s. 2½d. per lb., on spot, duty paid; foreign, unchanged at 1s. 1d. per lb., duty paid.

COCONUT (DESICCATED).—Business has been quiet, with all values maintained. Spot, fine, 27s. 6d. pcr ewt.; mcdium, about 27s. per cwt.

GINGER.—Market has remained quiet, with values showing no change. West African is quoted on spot at about 29s. per cwt.; shipment, June–July, unehanged at 24s., c.i.f. Jamaican, spot, small medium, 52s. 6d.; bold, in barrels, 85s. per cwt., ex store. Cochin, unwashed, 45s. per ewt., ex store; shipment, 33s. per cwt., c.i.f.

GUM ACACIA.—Kordofan cleaned sorts is now firmer on spot at about 77s. 6d. per ewt.; shipment values are nominal.

HONEY.—Market quiet but steady. Jamaican, spot, nominal at about 90s. to 105s. per ewt. Canadian is quoted at about 95s. per cwt., ex store, with supplies limited. Some Australian is reported available in London at between 80s. to 85s. per ewt., according to grade.

Hydrastis.—Values about steady, market quiet. Spot quotations for untested root are in the region of 20s. per lb., and tested is at about 23s. per lb.

IPECACUANHA.—Good-test Matto Grosso continues firm on spot at about 28s. upwards per lb., ex store; shipment, July-August, firm at about 24s. 9d. per lb., e.i.f. Minas, spot, about 11s. 6d. to 12s. per lb., according to test; shipment, July-August, about 9s. per lb., c.i.f. Ext. 19Ee. L10., 35s. 6d. per lb. for minimum lots of twelve winchesters.

MENTHOL.—A steady eonsuming demand exists for the Chinese material; spot, about 16s. to 16s. 6d. per lb., duty paid, and 13s. 9d. to 14s., in bond. The most recent priec from China was 15s. 3d. per lb., c.i.f. Japanese is quiet; K/S brands are at about 20s. per lb., duty paid, and 19s., in bond; shipment, about 24s. per lb., c.i.f.

MERCURY.—Remains at the advanced price of £53 18s. 6d. per bottle of 34.5 kilos quoted last weck, ex warehouse London, without engagement and subject to confirmation.

PEPPER.—Nominal. Lampong, in bond, spot, 34d. per lb.; shipment, June-July, 2\(^2\)d., c.i.f. Tellieherry, spot, 4\(^2\)d.; shipment, June-July, 34s. per cwt., e.i.f. Aleppy, spot, 4\(^2\)d.; shipment, June-July, 34s. per cwt., c.i.f. White Muntok, spot, duty paid, 5d.; in bond, 4\(^2\)d.; shipment, July-August, 4\(^3\)d. per lb., e.i.f.

PIMENTO.—Market quiet; prices as quoted last week. Spot, about is. per lb.; shipment nominal

per lb.; shipment nominal.

Rubber.—Small business passing. Standard ribbed smoked sheet, spot, 33d.; shipment, July, 134d.; August, 13d.; October-December, 114d. January-March, 114d. per lb.

SEEDS.—ANISE.—Spot, Syrian, 80s., duty paid; Cyprus, 80s., duty frec. Canary.—Spot, duty paid, Mazagan, 25s.; Morocco, 24s. 6d.; Plate, 24s. Caraway.—Dutch quoted at 150s., duty paid, Coriander.—Market firm; Morocco, sold on spot at 25s., duty paid, and 23s., in bond. Cumin.—Spot, Malta, 85s., duty free; Morocco, 80s., duty paid, and 75s., in bond. Dill.—Spot, Indian, 36s., London or Liverpool. Fennel.—Spot, Indian, 55s. to 57s. 6d., London or Liverpool; Iran, 50s. to 55s., in bond. Fenugreek.—Spot, Morocco, 20s., duty paid, and to sin bond. Spot, Morocco, 20s., duty paid, and 19s., in bond. Mustard.—Spot, 57s. 6d. to 67s., according to quality.

SENEGA.—Spot firmly held at about 4s. 3d. to 4s. 7d. per lb.; shipment, June-July, about 3s. 4d. per lb., c.i.f.

Senna.—Spot values of Tinnevelly unchanged from the prices detailed last week; Alexandrian nominal.

Tragacanth.—Quiet; quotations unehanged. Finest selected white ribbon, from £82. No. 1, white, £75; No. 2, white, £63; No. 3, white, £49; pale leaf, £30; amber leaf, £21; red leaf, from £10 10s. Woody and hoggy, from £5. All prices are per ewt., ex store London.

TURMERIC.—Spot, Madras and Rajapore finger, quoted at 42s. 6d. No business reported.

Waxes.—Bees': Market steady. Spot, from 175s.; in bond, 160s.; shipment, Dar-es-Salaam, 166s. per cwt., c.i.f. Japanesc, first three brands, spot, 120s., duty paid; shipment, 110s., c.i.f. Carnauba: Fatty grey, 385s.; chalky grey, spot, 380s.; Primeira, spot, 475s.

Essential and Expressed Oils, etc.

Business in these markets is quiet, with prices mostly steady. More inquiry is noted in anise (star). Good-quality artificial bergamot is now available. Grapcfruit is firmer.

Almond.—Quiet and steady. Expressed, spot, about 3s. 5d. to 3s. 11d. per lb. in ewt. lots, and up to 3s. 11d. for smaller quantities, cx store. Genuine French bitter is valued at about 13s. 6d. to 14s. 6d. pcr lb. ex store.

Anise (STAR).—More inquiry. Tins in cases, about 4s. 3d. pcr lb.;

drums, about 4s. 12d.; no shipment prices.

BAY.—From about 5s. 3d. to 6s. per lb., ex store, according to quantity. BERGAMOT.—Spot value for genuine oil is nominal—about 55s. per lb. being mentioned—but the price would have to be negotiated. In view of the limited supplies of genuine oil, some interest is being taken in artificial products of good quality, which are quoted at about 15s. to 15s 6d. per lb.

Bois de Rose.—Firm and unchanged. Spot, about 9s. to 9s. 6d. per lb. No shipment offers.

CITRONELLA.—Market steady; quotations unchanged. Ceylon, spot, about 2s. 4d. to 2s. 6d. per lb. for drums; small quantities up to about 3s. per lb.; shipment, drums, about 1s. 11d. per lb., e.i.f. Java, spot, about 2s. 6d. to 3s. per lb.; shipment, about 1s. 9d. per lb., e.i.f.

GRAPEFRUIT.—Firm. Genuine Californian oil now quoted at about 12s. 6d. per lb. and upward.

Lemon.—A nominal figure of about 25s. to 26s. per lb. is mentioned for genuine hand-pressed Sicilian oil, with other grades at cheaper prices. Californian oil, distilled, regular quality, is quoted at 9s. 6d. per lb., ex

wharf. No shipment prices for eold-pressed are available. Lemongrass.—Market quict. Spot is valued at about 4s. 6d. pcr lb.; shipment, steady at about 3s. 9d. per lb., c.i.f.

Lime.—Genuine West Indian quoted on spot at about 30s. per lb.; other qualities at lower prices.

OLIVE.—The Ministry of Food controlled price paid by importers for large bulk quantitics in 50-gall. drums is unchanged. Distributors' prices for a few gallons, packed in gallon tins, carriage paid, now range from 12s. 6d. to 13s. 6d. per gall., aecording to quantity.

Orange.—There has been less inquiry for this product. French Guinea oil is steady at about 5s. to 5s. 6d. per lb., with shipment at about 3s. 9d. per lb., c.i.f. Californian oil is quoted in sterling at 4s. 10d. per lb., in small drums, ex store, duty paid, limited supplies only being available.

Отто оf Rose.—Bulgarian is quoted at about £80 and Anatolian at about £60 per kilo.

PALMAROSA.—Market firm, with spot supplies limited. Spot, about IIs. 6d. to 12s. 6d. per lb., ex store; shipment, firm at about IIs. per lb.,

-Any genuine Singapore oil on spot would be worth about 40s. per lb. Seychelles oil is valued at about 30s. per lb., nominal. No shipment prices. Limited quantities of English distilled are reported available at about 46s. to 50s. per lb.

PEPPERMINT.—Better inquiry for Japanese. Spot stocks are limited and firmly held for about 9s. 4½d. to 9s. 6d. per lb. Japanese shippers are quoting about 8s. 6d. to 9s. 3d. per lb., c.i.f., for July-August shipment, but no business is reported at these prices. Chinese is firm and unchanged at the prices quoted last week. American natural oil remains steady: Quoted at 14s. 3d., in drums, and 14s. 6d., in tins in cases, e.i.f. Spot, about 16s. per lb., ex store.

ROSEMARY.—Spanish, about 3s. 6d. to 4s. per lb., ex store; Tunis, if available, about 4s. 6d. per lb.

SANDALWOOD.—Genuine East Indian Mysore, in onc-ease lots, 19s. per lb. East Indian, produced outside the province of Mysore, 18s. per lb. for bulk quantities. English-made West Indian, 15s. per lb. Australian, one-case lots, 16s., and five-cwt. lots, 15s. 6d. per lb.

Turpentine (American).—Values are steady: London, 54s. 9d. per cwt., tax paid, in barrels, ex wharf; Liverpool, 61s., in barrels, ex storc.

VETIVERT.—Bourbon on spot is worth about 30s. per lb., and Java, about 25s. per lb., ex store.

Wormseed.—Market steady; quotations unchanged. Spot, about, 24s. 6d. per lb.; shipment, about 23s. per lb., c.i.f.

TRADE-MARK APPLICATIONS

The figures in parentheses refer to the classes in which the marks are grouped. A list of classes and particulars as to registration are given in "The Chemist and Druggist Diary and Year-Book," 1940, p. 275.

(From "The Trade Marks Journal," May 29, 1940)

ORFEX"; for india-rubber contrivances for surgical purposes, etc. (10) (IV). By A. J. McWaters, 23 Hanover Street, Liverpool, 1. 611,146.

"Rapco"; for photographic prints (16) (IV). By Berk Guissin, Whitmoor Common, Worplesdon. 611,509.

APPLICATIONS FOR TEMPORARY SUSPENSION

(Under Section 3 of the Patents, Designs, Copyright and Trade Marks (Emergency) Act, 1939)

448,683 and 553,778 owned by Dansk Chemo-Therapeutisk Selskab A/S—H. R. Napp, Ltd., 3 and 4 Clement's Inn, Strand, London, W.C.2. Nos. 498,141 and 584,349 owned by Charley Notter, trading as Dr. Rudolf Reiss Rheumasan und Lenicet Fabrik—Francis Riddell, Ltd., Axtell House, Warwick Street, Regent Street, London, W.I.

(From "The Trade Marks Journal," June 5, 1940.)

"Bull Dog"; for egg preservative (1) (IV). By A. P. Stanley, "Kaleida," Kig Hill, Linby, Notts. 611,537.

"Nutreline"; for hair preparations (3) (IV). By A. & F. Pears, Ltd., London Road, Isleworth. 610,748 (Associated.)

"ROULAC"; for cosmetics (3) (IV). By Roux Distributing Co., 1841 Park Avenue, New York, U.S.A. 610,768.

"Frolic"; for cosmetics, etc. (3) (IV). By Piesse & Lubin, Ltd., Moor Lane, Kersal, Manchester. 611,338.

"ROLL CALL"; for soap and toilet preparations (3) (IV). By Virginia's Hollywood Preparations (1936), Ltd., 514 Ipswich Road, Slough, Bucks. 611,631.

"Neurased"; for medicinal preparations for nervous disorders (5) (IV). By Amido Société Anonyme, 26 and 28 Rue des Tours, Lille, France. 610,211.

"Digestisan"; for medicated preparations for the digestion (5) (IV). By A. Bauer, 22 Howitt Road, London, N.W.3. 610,834.

"Kiddlax"; for a chocolate laxative (5) (IV). By J. Cronow, 20 Ingestre Road, Hall

Green, Birmingham. 610,960. "Kelfo"; for biological and dietetic foods, etc. (5) (IV). By Curative Nutrition, Ltd., 57A Holborn Viaduct, London, E.C.I. 610,985.

"Piraquin"; for veterinary preparations and medicines (5) (IV). By Evans Sons Lescher & Webb, Ltd., Hanover Street, Liverpool, 1. 611,085.

"Jaap's"; for medicated saline preparations for sale in Scotland and N. Ireland (5) (IV). By J. Jaap & Co., 268-270 Buchanan Street, Glasgow, C.1. 611,163 (Associated.)

"Карауіт" and "Synkayıt"; for pharmaceutical preparations (5) (IV). By Roche Products, Ltd., Broadwater Road, Welwyn Garden City. 611,333, 611,334.

"Gartol"; for pharmaceutical preparations for veterinary use (5) (IV). By F. J. Brown, Malting Farm, Hanslope, Bletchley. 611,396.

"Broven"; for medicated preparations for bronchial asthma (5) (IV). By Moore Medicinal Products, Ltd., Burlington Gardens, London, W.I. 611,514.

"Kallomax"; for surgical, medical, dental and veterinary instruments and apparatus (10) (IV). By I.C.I. (Plastics), Ltd., Wexham Road, Slough, Bucks. 609,952 (Associated.)

"Sparklets, Ltd., Thames House, Millbank, London, S.W.I. 611,277 (Associated).
"Isothene"; for all goods (17) (IV). By I.C.I. (Fertilizer & Synthetic Products), Ltd., Wexham Road, Slough, Bucks. 610,443 (Associated).

(From "The Trade Marks Journal," June 12, 1940.)

DMPA"; and a design of baby playing in a romper and the words "a Rompa product"; for toilet preparations (3) (IV). By Walker Fabrics, Ltd., Chepstow Street, Manchester, 1. 609,816/7 (Associated).

"High Hat"; for toilet preparations (3) (IV). By Saville Perfumery, Ltd., Rickmansworth Road, Watford. B610,631.

"GUARDEE"; for lipstick (3) (IV). By Lentheric, Ltd., 17 Old Bond Street, London,

W.I. 610,917.

"Hormorevitin"; for toilet preparations containing hormone extracts (3) (IV). By Tatiana Gourlande, 32 Davies Street, London, W.I. 611,118. "Pilgrim"; for disinfectants and germicides in tablet form (5) (IV). By Pilgrim Pro-

ducts, Ltd., 18 Essex Street, Strand, London, W.C.2. 610,353. "Menvapor"; for medicated ointments (5) (IV). By S. S. Garnham, 100 Alexandra Drive, Surbiton. 610,418.

"Duosthetic"; for pharmaceutical preparations (5) (IV). By Air Filter Cap Co., Ltd., 105 Tonbridge Road, Maidstone. 611,150.

"Tricavin"; for pharmaceutical preparations (5) (IV). By C. R. Harker, Stagg & Morgan, Ltd., Emmott Street, Mile End, London, E.I. 611,292.

A cross device with the words "Mothproof—Mitin" (word "Mothproof" disclaimed); for moth repelling and destroying preparations (5) (IV). By J. R. Geigy Société Anonyme, 215 Schwarzdallee, Basle 16, Switzerland. 610,440 (Associated).

"Nomono"; for moth repelling and destroying preparations (5) (IV). By Lewis (Import & Export), Ltd., Hamsell Street, Jewin Street, London, E.C.I. 610,662.
"Orosed" and "Orosedan"; for medicated tablets for treatment of ear diseases (5) (IV). By Coates & Cooper, Ltd., 94 Clerkenwell Road, London, E.C.I. 611,545, 611.546 (Both Associated).

Diamond-shaped device enclosing letters "B.S.I." (letter "B" and letters "B.S.I." disclaimed); for hypodermic needles (10 (IV).. By J. L. Hatrick & Co. (London), Ltd., 58 Britton Street, Clerkenwell Road, London, E.C.1. B609,524.

Design of dog for safety razors and safety razor blades (8) (IV). By The Rotax Razor Co., Ltd., Eldon Street, Sheffield. 611,400/7483S.

(From "The Trade Marks Journal," June 19, 1940)

"RUTHURTEX" and "RUTHURTRACE"; for sensitized photographic tracing linen films and papers (1) (IV). By Ruthurstat, Ltd., Astor House, Aldwych, London, W.C.2. 611,543/4. (Both Associated.)

Design of rose and scroll, etc.; for gallic acid, etc., for use in industry (1) (IV). By J. L. Rose, Ltd., Chemical Works, Abbey Road, Barking. 611,680.

"Pelonin"; for pharmaceutical, veterinary and sanitary preparations (5) (IV). By Glaxo Laboratories, Ltd., Greenford Road, Greenford, Middlesex. 610,855.

CORRESPONDENCE

Correspondents may adopt an assumed name, but must in all cases furnish their real name and address to the Editor

Air-Raid Casualties

SIR,—I support your proposal that the question of payment to chemists for dressings used in treatment of air-raid casualties (C. & D., June 22, p. 449) should be raised again. Any day now we may be faced with heavy raids causing a large number of casualties and, as the public have always been accustomed to run to the pharmacy for first-aid for minor injuries, it is a certainty that pharmacists, whether officially recognised or not, will have injured persons applying to them for help after a raid. Chemists are quite ready to give their services free, and further to grant the use of their premises without payment, but they should not be expected to supply dressings and other necessities without some guarantee of reimbursement. Yours faithfully,

SPLINTS (24/6)

Profits and Remuneration

SIR,—The Order making an addition to the first schedule to the Prices of Goods Act (C, & D), June 22, p. 443) will be welcome to the small shopkeeper (whose profits too often represent his wages and are frequently lower than they would be if he were an employee of a large firm) because under it the salary of a manager is to be counted as part of the costs of the business. Hitherto a man in business for himself has not been supposed to receive any wages. but only to draw his profits, though he may work much harder for the amount he draws than a good many employees. The method of assessing income-tax returns has placed the individual shopkeeper under similar disadvantage, and perhaps in the future a parallel alleviation may be granted.—Yours faithfully,

INDIVIDUALIST (22/6)

MISCELLANEOUS INQUIRIES

We do not undertake to analyse and report upon proprietary articles nor to publish supposed formulas for them

White Henna.—B. R. & Co. (19/6).—This is the name given to a powder used for bleaching the hair. The composition is:-

Magnesium carbonate 62.0 Sodium perborate 38.0

The powder is made into a paste made with water and hydrogen peroxide and applied to the hair.

Hair Rinses.— V. B. Ltd.—(24/6).—Rinses for the hair of the type you have in mind can be made as follows:-

	1	Чеппа	Rinse		
Henna leav	es (coars	ely gr	ound)		 10.0
Alcohol					 44.0
Water					 45.75
Perfume					 0.25
	Che	атот	le Rins	e	
Chamomile	flowers				 10.0
Alcohol					 44.0
Water		٠.			 45.75
Perfume					 0.25

Boil the water and while boiling add the henna leaves or chamomile flowers. Remove from the heat and allow the mixture to stand for four hours. Run it through a strainer and add the alcohol and perfume.

Insect Bites.— A. W. R. (24/6).—Lotions and creams are the most popular applications for treating insect bites, and the following are representative formulas:—

		Cre	am		
Glyceryl mo	nostear	ate			 10.0
Linalyl aceta	ate				 3.0
Oil of cedar	leaf				 0.1
Menthol					 0.1
Kerosene					 30.0
Water				٠.	 53.8
Glycerin					 3.0
		Lot			
		Lou	on		
Menthol					 0.1
Naphthalene					 2.0
Ammonia sol	lution :	28%			 10.0
Tincture of v	vormw	ood			 20.0
Glycerin					 5.0
Alcohol					 62.9

Dissolve the naphthalene in the alcohol; add the tincture of wormwood and menthol. Add the glycerin and the ammonia.

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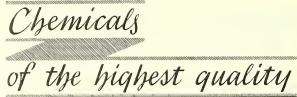
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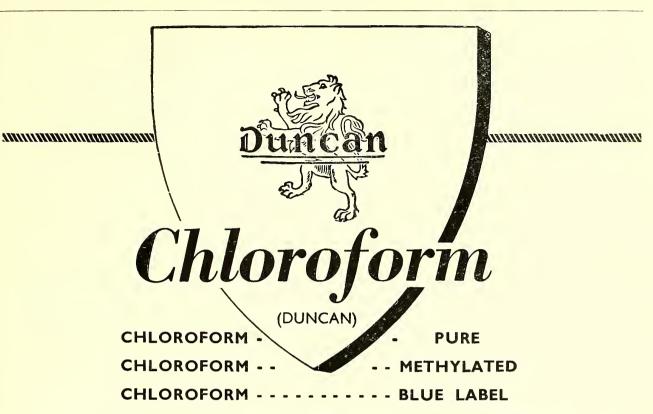
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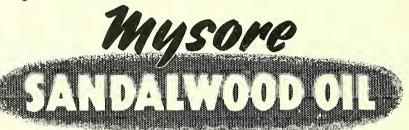
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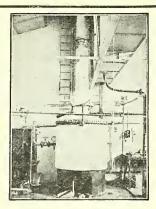
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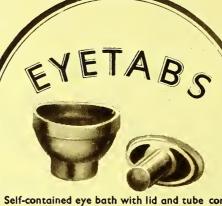
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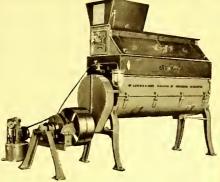
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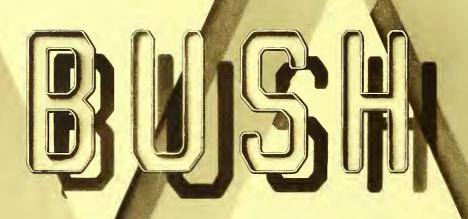
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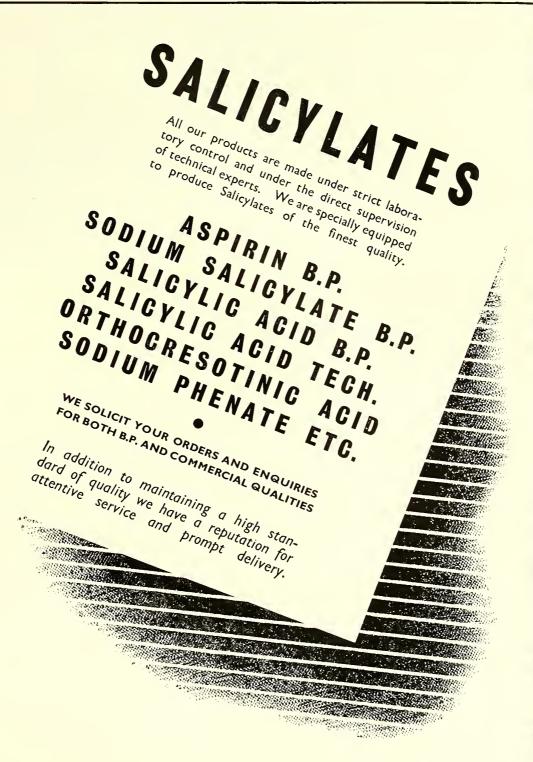
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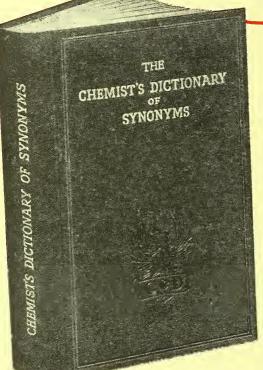
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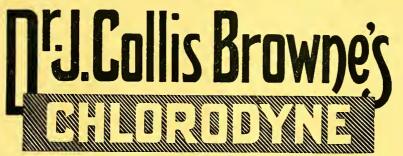
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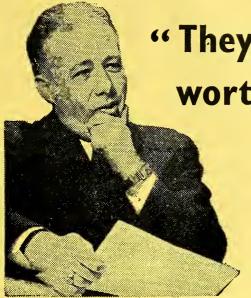
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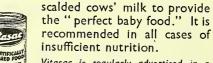
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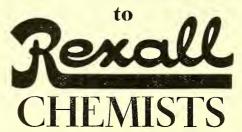
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These 55,000,000 advertisements are appearing at a time when the public is thinking daily of air raids and precautionary measures. They will exert a very powerful influence on the demand for SanIzal. We invite all retailers to co-operate in this campaign and to link up with it by showing SanIzal prominently on their counters and in their windows. We also suggest that retailers should check over their stocks of SanIzal to-day to make sure they have adequate supplies to meet emergency conditions.



In this hour of National Emergency every house-holder should have a bottle of SanIzal Disinfectant—it is a necessity in every shelter or refuge. (The Official Handbook recommends that a bottle of disinfectant should be kept in every shelter or refuge.)

We are doing our part to bring this important matter to the notice of the public by means of a vigorous advertising campaign more extensive than any we have previously devoted to SanIzal. Big, bold spaces are appearing in the National and Provincial newspapers, and during June and July alone more than 55,000,000 advertisements are scheduled to appear!

SANIZAL

THE BIG SIXPENNYWORTH
OF DISINFECTANT

Still at its

pre-war price of 6

NEWTON, CHAMBERS & CO. LTD., THORNCLIFFE, near SHEFFIELD

HOBSON'S CHOICE"

FEET PLAISTERS AND POWDERS

. . are in great demand

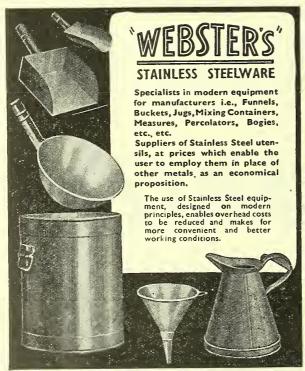
H.M. FORCES and A.R.P. WORKERS will be "Feeling the Pinch" of Tired and Aching Feet, and Chemists will be wise to stock up with "Hobson's Choice" Products. Backed by tram, and newspaper advertising, they prove to be a most profitable line. We now issue this new "Sales-Builder" pack.



Write for full details

HOBSON, TRIMBLE & CO., LTD., UNION HOUSE, LEEDS, 2 Plaisters 1 \frac{1}{2}d., 3d. and 4\frac{1}{2}d. Powdid. Powdid. Powdid. Powdid. Sprinkler Boxes.









Four Splendor Lines

that are creating sales records!



74,000,000 Tampax have been sold to date in this country alone and the demand grows steadily. Tampax sells wherever displayed and every sale opens up a new and permanent demand showing 4½d. profit on each 1/6d. packet. Packets of ten 1/6d. Packets of six 1/-.

Packets of three 6d.

TAMPAX The Modern Sanitary Protection-worn internally



Specially designed for a popular market, Holly-Pax covers a very large and steadily increasing low-price demand. Its sales are greatly stimulated by the many national services in which women are now active. Holly-Pax sells at 12 for 1/- and 6 for 6d.

holly-Pax The Popular-Priced Internal Sanitary Protection



There's nothing so quick, safe and certain for relieving pain as Propax. Moreover it has a double action, not only getting rid of the pain but getting rid of the poisons that cause the pain as well. Propax is a universal prescription for everyday pains and stresses including those to which women are specially subject. Equally suited for adults or children, Propax offers large sales and a substantial dealer profit. In 2 6 and 1/3 bottles.

PROPAX Double-Action Pain Relieving Tablets



The largest sales range of foot aids in the world, Cro-Pax taps a new and specialised source of demand wherever featured. Popular sixpenny and shilling lines provide an attractive and highly profitable display of steady best-sellers with profit margins that reach as high as 50% on sale! RETAIL 1/- per box, 8/- Dozen, BCNUS 14 to Dozen.

CRO * PAX Complete Range of Foot Aids

Splendor lines are widely advertised in national media. Full details and Trade Terms sent on request. Write to

SPLENDOR LIMITED

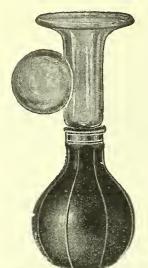
5, BEASTMARKET HILL, NOTTINGHAM

Ingram's "Omega" Breast Reliever

The "Omega" Breast Reliever is a standard 2-oz. capacity, and is sold in sealed cartons, none genuine unless bearing the name Ingram's



quired.



of "Ingram Made Quality Rubber," and fitted with glass and receiver specially designed for the particular purpose that this form of reliever is intended. Perfectly sterilizable. Can be supplied with "open" receiver if re-

Retail P.A.T.A. Price 3/9 each.

Ingram's Patent "Omega" Soothers

Made from "Ingram Quality Rubber"—pure Para, tasteless and free from all deleterious

compounds or "fillers." Put up each in a

separate hygienic carton. One dozen in a display box.

The Soother is kept in

perfect condition, easy to handle, and no wrapping necessary.

Made in two sizes, Large and Small, fitted with Straight or Cherry Teat. Retail P.A.T.A. Prices, Large size 6d., Small size 5½d. each.



Obtainable from all Wholesale Houses

J. G. INGRAM & SON LTD. LONDON INDIA RUBBER WORKS HACKNEY WICK, LONDON

Today the relationship between supplier and retailer has undergone a complete change. No longer is it the simple relation-ship of seller to buyer. For the whole ratio of supply and demand has altered. For the up a steady flow of new accounts, but of coping satisfactorily with the needs of existing customers. As for the chemist, he is more dependent than ever before on the goodwill and co-operation of the sundriesman. In these difficult times we are not allowing ourselves to forget our responsibility to our trade friends, some of whom have been doing business with us since 1850. More than ever before we are determined to justify our reputation for service—you can look to us for wholehearted co-operation.

BURGE, WARREN & RIDGLEY, LTD. 91-92 Saffron Hill, London, E.C.I

TELEPHONE: HOLBORN 0050 M5: "DRUGSUND SMITH, LONDON" ESTABLISHED 1850

To BUYERS of TRUSSES!

The most complete up-to-date facilities for the manufacture of RUPTURE APPLIANCES of every known English and American pattern are operating at

BLACK BULL WORKS, MARKET ROAD, LONDON, N.7

Hard Rubber, Celluloid, Leather and Mole

Covered and Elastic Band Trusses, under the

"MASTER" BRAND TRADE MARK



are sold in all Markets of the World.

"KO-RALLIUM." A new flexile covering for Steel Springs. It is Something Different! PERFUMERY BOTTLE WICKERERS in RAFFIA or SILK, plain or fancy, wide range of designs. Own bottles wickered at moderate cost.

Suspensory Bandages and Jock Straps

We offer distinctive lines of outstanding value. Our weaving sheds allow of all intermediate profits being passed to our customers.

Write for sample range at Special Rate, then compare.

F. SCHUTZE & CO., LTD.

Black Bull Works, Market Road, London, N.7



Share in the big business created by

THE WORLD-RENOWNED

ACADEMIC REGD.

MADE IN ENGLAND with the famous



SURGICAL HOSE



and for the treatment of all leg troubles

This natural and modern treatment, renowned for its perfect comfort, and strong anatomical support, is highly recommended by Doctors, Nurses and grateful users everywhere.

Academic Hose do not require more fitting than ordinary stockings. Simplicity and ease in handling Academic Hose is a most attractive feature for chemists.

Profit 9/6 on every pair sold

NATIONAL LINES MAINTAINS DEMAND

Write for literature, prices, trade terms, etc., to the makers:

Academic Depot, 156-162 Oxford St., London, W.I

Phone: Museum 6313

Telegrams: Eorgenlibi, Rath, London







The position of the Mercury column is at once perfectly plain. Red markings above 99.4.

ALL TYPES OF CLINICAL

AND OTHER

THERMOMETERS

PERKEN, SON & CO. LTD.

 (ESTABLISHED 1852) Price List on Application:

8 HATTON GARDEN, LONDON, E.C.1

Telephone: 0724 Holborn Telegrams: "Optimus, Smith, London"



lational" Dispensing Bottles

are Strong, Serviceable and Sure-sealing! NEATLY PACKED IN 6 DOZEN NON - RETURNABLE CARTONS

- ★ CONVENIENT IN SIZE
- ★ EASY TO HANDLE
- * UNIFORM IN QUANTITY

ALSO . . . Cork mouth Bottles WASHED & PAPERED Screw mouth Bottles WASHED & CAPPED

SCREW CAPS SUPPLIED in

WHITE-ENAMELLED TIN PLATE WHITE-ENAMELLED ALUMINIUM BLACK BAKELITE MOULDED



HAVE YOU GOOD STOCKS OF "NATIONAL" VIALS?

Ranging in size $\frac{1}{2}$ oz. up to 3 oz. Plain or teaspoon graduations Medium & tall types

MANUFACTURED IN BEST QUALITY WHITE FLINT, AND PACKED IN FREE NON-RETURNABLE CARTONS



May we advise Name and Address of nearest "NATIONAL" distributor?

NATIONAL GLASS WORKS (YORK) LTD. FISHERGATE, YORK

WORKS:

Phone: HOLborn 2146

First Avenue House, High Holborn, London, W.C.1 (WHOLESALE ONLY)

CHEMIST AND DRUGGIST

This Supplement is inserted in every copy of The Chemist & Druggist

28 SSEY STREET LONDON W.C.20

JUNE 29 1940

IMPORTANT NOTICE

The enormously increased cost and compulsory restriction of paper supplies, together with heavy increase in postal rates, have necessitated a revision of our tariff for classified advertisements. Advertisers are asked to note carefully the new rates which are now operative.

ADVERTISEMENT TARIFF

AGENCIES, GOODS FOR SALE, PARTNERSHIPS, PATENTS, PREMISES TO LET, FOR SALE OF WANTED

7/6 for 36 words or less, 2d. for every additional word.

LEGAL NOTICES, SALE BY AUCTION, TENDERS—AND ALL SPECIALLY SPACED ANNOUNCEMENTS

1/9 per nonpareil line. (12 lines=1 inch, single column.)

EXCHANGE COLUMN 2d. per word (for Retailers, etc.) minimum 3/-

BUSINESSES for DISPOSAL

BUSINESSES WANTED

7/6 for 40 words or less, 2d. for every additional word. **MISCELLANEOUS SECTION**

(for Wholesalers, etc.), for odd and second-hand lots.

12/6 for 60 words or less, I/- for every additional 10 words or less.

SITUATIONS 2/6 for 18 words or less, Id. WANTED for every additional word.

BOX OFFICE NUMBER I/- EXTRA

All advertisements in this Supplement must be prepaid

★ SPECIAL NOTE. Advertisements are accepted up to FIRST POST THURSDAY MORNING of Week of Issue.

Any received too late will be inserted the following week

PLEASE MARK YOUR ENVELOPE "SMALL ADVERTISEMENT" AND ADDRESS TO

The Chemist & Druggist, 28 Essex St., Strand, London, W.C.2. Tele: Central 6565 (10 lines) Grams: "Chemicus" Estrand, London

* Emergency Address: The Chemist & Druggist The Pitman Press, Bath

SUPPLY OF SUPPLEMENTS

These will still be supplied free (not more than six at a time) on receipt of post office wrappers STAMPED ONE PENNY.

Every Pharmacist should possess a copy of this **New Edition** of ...

THE ART OF DISPENSING

Re-written, completely revised, with fresh illustrations and new features—this is the most up-to-date book obtainable on the subject of dispensing and compounding. It is in fact an essential part of the equipment of every dispensary. Compiled by experts for the use of the Craft, it simplifies the many problems which frequently arise in the day's work at the dispensing counter.

This book is the recognised authority on the subject—It gives practical information in concise form. You need a copy if you are to keep abreast of present day pharmaceutical practice.

PRICE 10/6 11/- Post Free

Order from your usual wholesaler, or from the Publisher.



CHEMIST AND DRUGGIST
28 ESSEX STREET, STRAND, LONDON, W.S.2

THE ASSOCIATION OF MANUFACTURING CHEMISTS,

(Business Agency, Transfer & Valuation Department)
KIMBERLEY HOUSE, and at 5 RUMFORD PLACE,
Holborn Viaduct, LONDON, E.C.1 LIVERPOOL, 3.

PARKIN S. BOOTH, Valuer. Tels.: CITY 3691 (4 lines)
VALUATIONS. SALES OF BUSINESSES. STOCKTAKINGS.

Enquiries Invited.

BUSINESSES FOR DISPOSAL

EXCELLENT opportunity is afforded by the disposal of this Pharmaceutical Drug and Essential Oil distributor's business owing to the calling up of the proprietor for military service. Still plenty of scope for further improvements. Write-291/1, Office of this Paper.

FOR Sale by private treaty, old-established Chemist's Business; busy main road, London, N.; rent £70 per annum, including shop and house; vendor retiring; turnover approx. £800; stock and fixtures £350, worth more; total purchase-price required, £400; banker's or substantial reference must accompany inquiries. 281/4, Office of this Paper.

FOR sale. Recently established pharmacy in unopposed position in good residential town, lock up, rent £30, turn-over averaging £30 per week. Stock £250. Price £750 or near. Further particulars from 291/4, Office of this Paper.

SMART Attractive Herbalist and Chemist Business, main road position, London, absolutely sound concern, genuine reason for selling, going abroad, can show proof, will sell at sacrifice. Write 290/2, Office of this Paper.

SMALL Chemists' Business, near Bournemouth, light dispensing, could be carried on as drug store, double-fronted shop, living accommodation and garden. Low inclusive rental residential district. Net profit £156 per amum. Price value of stock and fixtures only approx. £350 or near offer. 292/2, Office of this Paper.

AGENCIES

 $\rm E^{NTERPRISING}$ firm of Manufacturing Chemists desire to contact wholesale houses or other organisations for marketing of lines throughout the country. Apply 366/433, Office of this Paper.

MANUFACTURING Chemists with connexion throughout country desire to represent house-disposing well-known lines. Apply 291/7, Office of this Paper.

WANTED

SPOT CASH offered for Miniature and other Cameras, Still and Cine Projectors, Lanterns and accessories, etc. Single pieces or complete stocks purchased. Write particulars to Cyril Howe, Abbey Churchyard, Bath.

URGENTLY required London large number second-hand shallow timber tanks. Full details, lowest prices. 366/439, Office of this Paper.

WANTED, Granulating Mixer and Oscillating Granulator for Powders for Tablet Making. CDB/143, Office of this Paper.

SITUATIONS OPEN

RETAIL (HOME)

 $B^{RIGHTON.}$ —Dispenser required, male or female, counter duties. Write CDB/147, Office of this Paper.

LONDON, E.C.1.—Unqualified Assistant required, dispensing and counter duties. Apply by letter to Taylors (London) Ltd., Staff Department, 70 Vauxhall Bridge Road, London, S.W.I.

L ONDON, N.—Lady Assistant, unqualified, required. Good dispensing experience essential and capable at counter. (Two ladies on staff.) Apply stating full experience, age, height and salary required to 291/5, Office of this Paper.

L ONDON, S.E.—Qualified Assistant wanted in medium-class business. Photo, toilet and N.H.I. Good Windowdresser. Apply stating agc, salary, experience. Permanency. 292/3, Office of this Paper.

NORTH Kent.—Vacancy occurs for junior qualified assistant. Good opportunity to gain experience with view to promotion later. Write, giving particulars, to CDB/149. Office of this Paper.

ALL HOSPITAL PHARMAGISTS & DISPENSERS SHOULD JOIN AT ONCE

The National Assoc. of Chemists' Assistants

INCORPORATED IN THE CHEMICAL WORKERS' UNION
BENEFITS: Trade Protection, Legal Aid, Unemployment Benefit,
Free Use of Employment Bureau
WRITE FOR PARTICULARS: Arthur J. Gillian, Gen. Sec.,
149 Newington Causeway, London, S.E.I

NORTH RIDING OF YORKSHIRE COUNTY COUNCIL

NORTHALLERTON EMERGENCY HOSPITAL

DISPENSER. Applications are invited from fully qualified male dispensers for this appointment, which is a temporary one: the salary offered is £250 per annum. Applications with copies of not more than three testimonials, should be forwarded, as soon as possible, to the undersigned.

H. G. THORNLEY, Clerk of the County Council.

COUNTY HALL, NORTHALLERTON. 24th June, 1940.

MANCHESTER District.—Wanted shortly or at once lady or gentleman junior assistant. Good salary and comfortable berth to right applicant. 292/1, Office of this Paper.

MANCHESTER—Unqualified Assistant, exempt military service. Hours 8.30 to 5.30. Sat. 1 p.m. State age, experience and salary. CDB/145, Office of this Paper.

SURREY.—Qualified Lady Assistant required for family dispensing business. Some high-class toilet trade. Write, giving particulars of previous experience, salary required, to CDB/148, Office of this Paper.

W.9.—EXPERIENCED Manager required for good-class family dispensing business. Good previous experience essential, including if possible, some West End. Commencing salary £5. Write CDB/146, Office of this Paper.

 ${
m M}^{
m ANAGER.}$ Qualified for high-class pharmacy and cosmetics for Yorkshire Branch. 366/438, Office of this Paper.

PHARMACY. Female Assistant required. Must have had pharmaceutical and general shop experience. Widows and single persons only considered. Apply in writing, stating age and experience, to the Staff Manager, Royal Arsenal Coperative Society, Ltd., 113 Powis Street, Woolwich, S.E.18. Endorse envelope "Pharmacy." Note: Canvass of members of the General Committee or officials will disqualify.

QUALIFIED Lady required for dispensing and counter.
Write, giving age, experience and salary required to Staff
Office, Welwyn Stores (1929) Ltd., Welwyn Garden City, Herts.

SAVORY & Moore, Ltd., require two Junior Assistants, qualified or unqualified, for branches in the country. Apply by letter only giving full particulars: age, height, experience and salary expected, to H. F. Stapley, 61 Welbeck Street, W.1.

TAYLORS British Chemists have vacancy for qualified Manager in North London; family type business. Permanency. Apply to: Retail Staff Manager by letter giving details of past appointments, Taylors British Chemists, 70 Vauxhall Bridge Road, London, S.W.1.

WANTED by Wholesale Druggists in Bristol, Pharmacist or Experienced Worker to take charge of Drug Department under "Manager." 289/5, Office of this Paper.

WELL ESTABLISHED IRISH FIRM

Having excellent connexion with CHEMISTS AND DRUGGISTS in both EIRE and NORTHERN IRELAND, is OPEN TO UNDERTAKE the REPRESENTATION OF ADDITIONAL LINES for duration of war. Satisfactory references, etc. available. Write, Box W.I. c/o McCONNELL'S Advertising Service, Ltd., 132 Fleet Street, London, E.C.4.

WHOLESALE

INVOICE Clerk required for London Wholesale Druggists. Write, stating experience, etc., 365/381, Office of this Paper.

SALES Department of leading pharmaceutical manufacturers in Hertfordshire require for duration Senior Assistant for home trade. Must be exempt from Services. Age limit 50. State fullest particulars of experience, where employed, age and salary required to Roche Products, Ltd., Pharmaceutical Dept., Welwyn Garden City.

TABLET Maker and Sugar Coater wanted, for London Wholesale Druggists. 365/382, Office of this Paper.

WANTED by Pastille and Lozenge Manufacturers, Travellers for London and Counties, Yorkshire, East Coast, Westmorland, Cumberland and Lancashire. Remuneration by salary, commission, and expenses. Apply with fullest particulars as to age, experience, connexions and remuneration expected, etc. CDB/144, Office of this Paper.

SITUATIONS WANTED

RETAIL (HOME)

A SSISTANT, over 17 years' varied experience; 5 years' apprenticeship (indentured). West End, country and watering-place. Dispensing, photo, veterinary. Registered Dentist (prescribed exam.). Over military age, seeks position of trust. "D.," 42 Preston Road, Brighton.

A SSISTANT (37) unqualified, married, requires permanency, thoroughly experienced, accurate dispenser, keen counterman. Hunt, 49 Wrestwood Road, Bexhill-on-Sea, Sussex.

DURATION. 25 years' experience D.D.A.'s Poisons, etc., Wet, Drys' Stock Counter; Home, Export. "Rhei," 12 Tasmania Terrace, N.18.

QUALIFIED (25) dosires position in North of Scotland, good experience London and provinces. Free one month. P.C.B., 342/34, Office of this Paper.

RESPONSIBLE Post Required. Termination of employment with present firm, ten years as manager, inevitable as voluntary evacuation increases. Single, 32, own optical equipment. E. F. Sackett, M.P.S., F.S.M.C., 8 Grange Road, Ramsgate.

UNQUALIFIED. Age 53, height 6 feet; first-class references and experience; present position 19 years; North London preferred, but not essential. "Rhei," 58 Belsize Avenue, Palmers Green, N.13.

UNQUALIFIED, middle-aged, active, 30 years' experience dispensing and general work. Excellent references (London), "Mac," 35 Parolles Road, N.19.

40 Unqualified. Married over 25 years. Experience in retail pharmacy, dispensing counter. Windows, and general management. "Free now." Excellent references; particulars to Purdy, Slievemore, Fordingbridge, Hants.

COLONIAL, INDIAN AND FOREIGN

BACHELOR (47), tall, slim, active; experienced assistant, manager or traveller; requires berth, India or S. Africa; August onwards. Austin, "Burgoyne," Lancing.

WHOLESALE

A DVERTISER disengaged, wishes to represent a good-class house, medical, toilet, veterinary. First-class experience in all branches. "B.P.," 38 Eardley Road, Streatham, S.W.16.

EXPERIENCED Chemist (F.I.C.), manufacturing, commercial, pliarmaceutical, just returned from the Continent, age 60, seeks post for the duration of the war. A. R. Smith, Ferndown, Wimborne, Dorset.

EXPORT. As a result of war, business man, 34, not liable military service, seeks employment, responsible position. Many years' export experience with available active connexions, particularly British India, in Chemicals, Medicinal and Toilet Preparations, Patent Food Stuffs. Perfect knowledge of French, German, Russian languages. P.C.B./342/28, Office of this Paper.

NORTHERN Ireland; Traveller; 32 years; car; connexion chemists; desires salaried position; would consider agencies; excellent references. 288/4, Office of this Paper.

SALESMAN optimist disengaged will cheerfully represent you for duration, England and Wales, connexion over 5,000. Worker. Excellent references. P.C.B., 342/33, Office of this Paper.

MISCELLANEOUS

OFFERS—2 Demijohns triple rose water—cwt. cera paraffin—10 gallons lysol—cwt. aspirin powder—cwt. shellac—cwt. mica powder—4 × 1 collapsible aluminium tubes—100 gross 1 grn. pil. hydrarg—cwt. toothpaste power mixer—4½ h.p. a.c. motor—Browns alembie—5 gallons acetone—7 lb. butyl acetate—20 lb. cinnamic alcohol—20 lb. iodised tablets—2 ozs. ephedrine—aluminium caps—gallon duplicating ink—gas boiling pans. Sanovia, Angell Road, Brixton.

LONDON COLLEGE OF PHARMACY

20% of Particular and the Control of the Control of

FOUNDED BY THE LATE H. WOOTTON, B.Sc.

C. W. GOSLING, Ph.C.

Principal: IRVINE G. RANKIN, B.Sc., Ph.C.

SPECIALISTS IN TRAINING PHARMACISTS

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- 9 Months—October to June
- 3 Months Separate Complete Revision Courses every term, Oct.-Dec., Jan.-March April-June, July-Sept.

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NEXT SESSION COMMENCES OCTOBER 2nd, 1940

POSTAL COURSES OF PREPARATORY STUDY FOR THE PRELIMINARY SCIENTIFIC AND THE C. & D. QUALIFYING ARE AVAILABLE FOR APPRENTICES AND JUNIORS AT ANY TIME BEFORE ENTERING COLLEGE

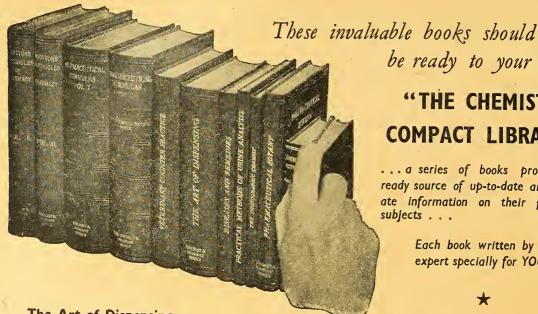
"Essentials of Pharmacy"

6/6 post free

Apply to:-

Tel. No.:--BRIX7ON 2161

361 CLAPHAM ROAD, S.W.9



be ready to your hand.

"THE CHEMISTS" COMPACT LIBRARY"

... a series of books providing a ready source of up-to-date and accurate information on their particular subjects . . .

> Each book written by an expert specially for YOU!



The Art of Dispensing

Accepted by authorities as the standard work on the subject. New edition (1937) completely revised, re-written and thoroughly up to date.

Price 10s. 6d. (11s. Post free)

Veterinary Counter Practice

New and entirely revised edition (1938). The most useful book ever published on this subject.

Price 10s. (10s. 6d. Post free)

Dictionary of Medical Terms

A completely new edition (1939). Comprehensive, thoroughly revised and greatly enlarged, this book gives concise definitions of medical terms. A book you should have ready to hand. Price 8s. 6d. (8s. 10d. Post free)

Diseases and Remedies

Newly revised and brought up to date (1936). Contains information of practical value and a host of reliable formulas for counter-prescribing. Price 7s. 6d. (7s. 10d. Post free)

A Handbook to Pharmacy

Any book by William Kirkby, M.Sc., Pharmaceutical Chemist, is worthy of note. Invaluable for rapid reference purposes in dispensary or laboratory.

Price 5s. (5s. 4d. Post free)

Pharmaceutical Formulas (Vol. I)

The most complete pharmaceutical formulary in the English language. 1,146 pages. An invaluable

Price 15s. (15s. 6d. Post free)

Pharmaceutical Formulas (Vol. II)

Published 1934. Supplementary to Vol. I and known as the Chemists' Recipe Book. Replete with an amazing variety of formulas. Over 1,000 pages.

Price 15s. (15s. 6d. Post free)

Practical Methods of Urine Analysis

Written by an expert pharmacist and revised by a medical practitioner experienced in clinical analysis. 97 pages.

Price 4s. (4s. 3d. Post free)

The Photographic Chemist

A concise guide to Chemists commencing and carrying on a photographic department.

Price 3s. 6d. (3s. 8d. Post free)

Pharmaceutical Botany

A useful gift for apprentices and assistants who have not passed the qualifying examinations.

Price 5s. (5s. 4d. Post free)

Wootton's Chronicles of Pharmacy

A fascinating study of the evolution of Pharmacy. Two volumes. Maroon cloth. 770 pages. Price 12s. 6d. (13s. Post free)

The C. & D. Poisons Guide (3rd Edition)

Authoritative, accurate and concise. Classifies over 3,000 poisons. Price 4s. 6d. (4s. 9d. Post free)

The C. & D. Price List Formulary

A choice collection of good formulas. All users of the C. & D. Price List require a copy of this formulary.

Price 2s. 6d. (Post free)

The C. & D. Stocktaking Pad

Halves your stocktaking worries. Simple to use. Saves time and money Price 2s. 6d. (Post free)

Shops Act Cards

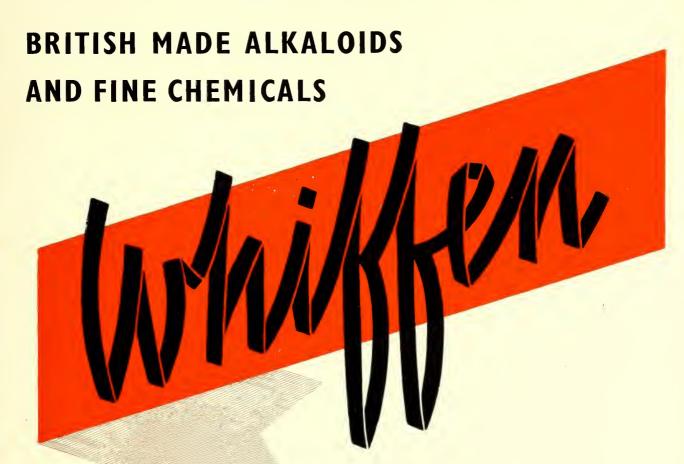
Price Is. each, 2 for Is. 9d. (Post free)

Rising production costs will eventually affect prices. You can buy at pre-war prices if you order at once.

Order from The PUBLISHER, THE CHEMIST and DRUGGIST

28 ESSEX STREET, STRAND, LONDON, W.C.2

Phone: CENTRAL 6565



BROMIDES IODIDES
MERCURIALS ATROPINE
CAMPHOR NICOTINIC ACID
SALICIN CAFFEINE EMETINE
QUININE STRYCHNINE NICOTINE
VERMILION PRUNELLA
ESSENTIAL OILS CLOVE OIL
SANDALWOOD OIL ALMOND OIL
EXTRACT OF IPECAC. LIQ.
DRUG GRINDING

WHIFFEN & SONS LTD.

INCORPORATING GEORGE ATKINSON & COMPANY. EST. 1654.

FULHAM · LONDON · S·W·6

'PHONE FULHAM 0037 'GRAMS WHIFFEN LONDON

Service



World-wide

PILLS & TABLETS

"OWN NAME"

FORMULAE

PACKED GOODS



ARTHUR H COX & CO. LTD.

Manufacturing Chemists
BRIGHTON · ENGLAND

ESTABLISHED OVER A CENTURY